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ABSTRACT

A project called "radioprimaria" is bringing classes by radio to fourth, fifth, and sixth grades in a rural area of Mexico to make up for the lack of teachers in these grades. Even though the project was largely unsupervised and plagued with disorganization and equipment problems, children taught with radio did as well as children in the traditional classes, as measured by achievement scores. A more serious problem in the contest of "radioprimaria" is that while education is highly valued as a means to better jobs and a more affluent life style in the cities, the city slums are jammed by the rural influx and there are already more educated persons than there are appropriate jobs. Therefore, "radioprimaria" is seen as somewhat useful in the process of rural education, but rural education, given current conditions, is hardly useful at all. (Author/RH)

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A REPORT ON THE SYSTEM OF RADIOPRIMARIA IN THE STATE OF SAN LUIS POTOSÍ, MEXICO

BY

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U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
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TABLE OF CONTENTS

CHAPTER PAGE

Summary.....5

1. Introduction to *Radioprimaria*.....9

2. How Does *Radioprimaria* Work?.....19

3. Observations of *Radioprimaria*.....30

4. The Achievement Tests.....37

5. The Costs of *Radioprimaria*,
by Steven Klees.....45

6. The Teachers' Questionnaire.....51

7. Interviews with the Rural People.....61

8. Industries and Labor Offices.....73

9. Reflections.....81

Appendices

A. Summary of Observations.....90

B. Schools That Have Ever Used Radio.....92

C. The Tests.....94

D. The Teachers' Questionnaire in Full,
With the Results for Each Item.....114

E. Industries: Person Interviewed, Size
in Number of Employees, Product.....126

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SUMMARY

This report reflects six months' observation (June-December 1972) of the use of radio for increasing primary education in a rural area of Mexico. In and around the city of San Luis Potosi, two hundred sixty miles northwest of Mexico City, a project called radioprimaria began in the fall of 1970. This project brings classes by radio to fourth, fifth, and sixth grades to make up for the lack of teachers in these grades in the rural areas. It is now in its third year; this report represents the first evaluation of that project.

Seven weeks during June and July were spent in the rural communities within thirty miles of San Luis, talking to the parents there about their children, their hopes for their children, and the benefits they felt education might give to their children. A consistent desire for education came out, but with it came the conviction that education is a vehicle by which to escape the rural area. The rural people did not feel that their area was "develop-able", only that some children could develop themselves enough to go elsewhere.

Elsewhere means the city of San Luis Potosi. The rural

people believe that better job opportunities await them there if they come with their primary certificate in hand. Yet that many jobs just do not exist. In August, interviews were held with people who would know--personnel officers in industry and state labor officials. They spoke of a critical job shortage, of primary and secondary graduates in marginal jobs or no jobs at all, and of the press of rural immigration.

Following a summer in the rural communities and in the industrialists' offices, focus shifted to the school system and the use of radio within it. Achievement tests were given to the sixth-grade students and questionnaires to teachers in all six primary grades. Only some of the students and some of the teachers were using the radioprimaria system, so these two groups could be compared. Children taught with radio, it turned out, were receiving an education comparable to that of the children in the traditional system--this is what the achievement scores indicated. While the organization of the project had not strictly followed its original goals nor had the project been set up in any experimental form, some basis was found for being confident that radio can be used to increase education in these rural areas.

The teachers themselves are signs to the rural community that education leads to the city. The vast majority of the

teachers now commute from the city every day--they do not want to live in the rural areas. If they could teach in the city too, they would prefer that. Though the teacners believe very much in the need and the benefits of rural education, because they commute they do not endorse rural living. It is not surprising that the rural people believe that education is mainly a chance for them to move to the city.

Within the school system was found, in particular, a lack of supervision. The implementation of radioprimaria had been left to individual teachers, and many elements of the system were in disarray. Less than half the radio schools had an audible, functioning radio on the day we visited. The teachers themselves usually provided the radio. It was quite haphazard. A great deal more organization is needed for the radioprimaria system to be operating as had been planned.

The facts that no expenditures have been made in San Luis Potosi and that no new personnel have been hired to supervise the radio project show clearly in these organizational problems. The system differs widely from school to school, and stands most in need of some regular supervision. Certain fortunate circumstances have actually been the basis of the system so far, but now more orderly direction of the project is needed for it to be maintained or grow.

Full primary education in the rural areas is the goal of radioprimaria, but full primary education does not seem to have great practical value in the rural areas. While rural people believe that education can lead to jobs in the city, we found from many employers in San Luis that there are many more educated people than the available jobs can absorb. A rural immigrant's opportunities are slim; he tends to find only marginal work and swell the city's slums. We come to the paradoxical conclusion that there are too many educated people in San Luis--the other sectors of the society are not developed as well as the school system is. This undercuts any improvements within the educational system, such as radioprimaria.

So, radioprimaria is seen as somewhat useful in the process of rural education, but rural education emerges--in this rural situation in San Luis Potosi--as hardly useful at all.

CHAPTER ONE

Introduction to Radioprimaria

The Secretariat for Public Education (SEP) in Mexico has concluded that conventional forms of primary school cannot be extended to the whole country. The traditional teacher in his classroom for each grade, even limited to the primary grades of one to six, cannot be continued throughout most of the country, owing to the lack of teachers, buildings and teaching materials in the rural areas and to the continually mushrooming school population. The Mexican Constitution of 1917 promises a primary education to everyone, but, according to the government's own statistics, out of the 32,855 primary schools in the country only 6440 have the full six grades.

Even though public education takes the largest single percentage of the national budget, the fact remains that lack of funds is the basic problem. Teachers are unemployed because of the limited number of posts that the Secretariat can sustain. Some solution was needed that could increase the number of students served by the primary educational

system without increasing the costs. Mexico turned to educational technology, and specifically to radio, to meet this situation.

In the Mexican state of San Luis Potosi, 260 miles northwest of Mexico City, two-thirds of the total 1969 population was under 25 years old. 376,000 persons were between the ages of 6 and 14. The statistics for 1968 showed 218,210 students enrolled in the primary schools within the state. The primary school system included at that time 54 kindergartens; 1559 primary schools; and 4285 teachers. Most of the students, however, do not complete the primary level. Witness these statistics from 1968 in the State of San Luis Potosi:

TABLE ONE
Primary students in San Luis Potosi in 1968, by grade

Grade	Number of students
I	68,342
II	48,379
III	37,855
IV	26,014
V	18,934
VI	14,155

Source: SEP

Some dropouts occur because of academic failure, the need to work to support families, and disinterest on the part of students and their families. However, a major reason for the decreasing enrollment is simply the lack of school facilities.

It is particularly in the rural areas that the enrollment falls off sharply after the early grades of primary. As Table Two shows, while the total drop from first to sixth grade in the State of San Luis Potosi is from 68,000 to 14,000, in the rural areas this drop is from 48,000 to 3,000. In general terms, this means that while in the whole state one out of five first graders reaches the sixth grade, in the rural areas only one out of sixteen does. This does not refer to graduates of the sixth grade, but only to those who reach the sixth grade.

TABLE TWO
First and sixth graders in San Luis Potosi, 1968

	first grade	sixth grade	% who remain
urban*	20,000	11,000	55
rural*	48,000	3,000	7
total	68,000	14,000	21

*Urban schools are those within a city limits; rural schools are those outside a city, no matter how near or far

One constant fact in any discussion of Mexican education should be a clear distinction between the urban and rural areas. These statistics provide the first hint of major differences; these differences run through the data, both the statistics and the first-hand observations.

Table Three portrays the progress of the student cohort that entered the first grade in 1963 in the State of San Luis Potosi. In the first year, forty percent of the students dropped out. Only thirty percent reached the fourth grade, and only eighteen percent graduated. In each year, the figures are much worse in the rural areas, as can be seen in the cumulative percentages that are included in the table.

Seven out of ten rural children dropped out by the end of the second year, only fifteen in one hundred went to fourth grade, and only six percent graduated from primary school. For the urban children, the dropout rate is lower and more gradual, and fully half of them graduate from the sixth grade.

Yet the rural schools enroll more than half of all primary students--121,000 out of 218,000, or 56%, in 1968. As noted earlier there are 376,000 children in the State between 6 and 14 years old, so 158,000 do not begin school at all--probably the majority of them live in the rural areas. For the rural students, there are 1320 schools and 2200 teachers, while for the urban students there are 239 schools and 1915 teachers. What does this say? Simply that in the rural areas most of the schools are one- or two-teacher schools, and that the rural schools simply cannot cope with the federal requirement of providing six

TABLE THREE

Progress of the generation of 1963-68 in primary school in the State of San Luis Potosi

Grades and location	year	enrolled	dropouts	
			numbers	cumulative %
First		71,071	--	--
urban	1963	20,658	--	--
rural		50,414	--	--
Second		42,990	28,081	
urban	1964	15,094	5,564	27%
rural		27,896	22,517	44%
third		30,223	40,848	
urban	1965	14,881	5,777	28%
rural		15,342	35,071	70%
Fourth		21,567	49,504	
urban	1966	14,163	6,495	31%
rural		7,404	43,009	85%
Fifth		17,783	53,288	
urban	1967	13,502	7,156	35%
rural		4,281	46,132	92%
Sixth		14,779	56,292	
urban	1968	11,554	9,104	44%
rural		3,225	47,188	94%
Graduates		13,211	57,860	
urban	1968	10,326	10,332	50%
rural		2,885	47,528	94%

Source: SEP

grades of primary education. The dispersion of students in the rural areas makes it difficult to get the students together--thus the high number of schools for the rural children. The dropout rate is higher for these rural schools, even in the lower grades where schooling is presumbably available. We can presume that the efficiency

of these schools is not as high as that of the urban schools, in terms of cost per student and, particularly, in terms of cost per graduate.

A simple fact becomes clear: the rural areas demand so much in the way of educational resources and personnel that traditional education of one qualified teacher for each grade simply cannot now nor in the foreseeable future be extended nationwide.

As an alternative, the system called radioprimaria was created and begun on a small scale in the State of San Luis Potosi, within a thirty-mile radius of the capital city of the same name, San Luis Potosi. The Secretariat, in a brochure describing radioprimaria, stated the goals of the project:

1. that children of school age who live in rural communities and attend schools of less than six grades be able to complete their primary education in the ordinary time of six years;

2. that, as an extension of this project, the opportunity be given to persons above fifteen years of age, who for various reasons did not finish their primary education, to finish these studies as informal students.

In fact, up till now, the second purpose of radioprimaria has existed only in principle. Radioprimaria has focussed on the classroom. The basic idea of introducing radio into these schools has been to make up for a lack of

money to hire sufficient teachers. While the actual situations in the existing radio schools differ quite a bit, the idea behind radioprimaria was for a six-grade school with four teachers. Three teachers would be handling the first three grades in the traditional way, without radio; the fourth teacher would have the three older grades in one classroom and teach them with the assistance of the radio lessons. Thus, by supplementing the teachers who are now in the school system (not by replacing them), the radio system is meant to allow the full primary course to be taught where it has not been taught before and where its prospects for ever being taught were dim. The saving involved is the lower cost of radioprimaria compared to the salary of two more teachers.

The planning of the radioprimaria system as a pilot project began in August 1969. It was a joint effort of the Technical Department of Primary Education and the Direccion General de Educacion Audiovisual y Divulgacion (DGEAD). Broadcasting began in the school year of 1970-71. It was envisioned as an experiment to be evaluated in various rural areas and in some suburban schools in the Federal District. But because of organizational problems elsewhere, the only places where radioprimaria now exists are in one area around the city of San Luis Potosi and in one classroom at the Experimental Education Center in Mexico City.

The number of schools was limited to take advantage of the possibilities for experimentation and evaluation; about forty-six schools were meant to be representative of those that would be served by a national system of radioprimaria, and there was also the idea that the broadcasts could be a supplement to the fully staffed urban schools. This has not been stated as a specific goal, but could be an important third focus for the radioprimaria system.

Programming

Substantial themes are selected from the official curriculum of the fourth, fifth, and sixth grades--the only grades for which radioprimaria is broadcast. Emphasis is on Spanish, arithmetic, history, and geography, though material for physical education, nature study, and practical activities is broadcast too. Some themes are classified as "common", meaning that they can be understood by, and are therefore broadcast for, all three grades. Others are classified as "specific", those designed for, and broadcast to, just one of the three grades. This means that some radio programs are intended for all three classes which share one classroom, and that some programs go to only one group within the classroom. When the programs are being broadcast to one grade, the other students in the classroom are supposed to work on their own.

Five or six programs are broadcast each school day, so approximately 1250 programs are needed to cover the school year. Each program lasts fourteen minutes. For the most part, the programs have been the same or nearly the same in each of the three years that radioprimaria has existed. So a child who was in the fourth grade in 1970-71 is hearing the same programs this year, 1972-73, for the third time. These radio lessons are taped by a team of eight radio teachers in the studios of DGEAD in Mexico City. They are shipped by bus to San Luis Potosi, to Station XEXQ, the radio station of the University of San Luis Potosi, where they are broadcast without charge, Monday to Friday, from 9:00 a.m. until 12:45 p.m. In Mexico City, the broadcasts are over Station XEEP an hour earlier. In the capital, it is known that these lessons are picked up and used by schools and teachers who are not formally participating in the program. No evaluations have been done of those Mexico City schools that use radioprimaria this way.

On the average, in a five-hour school day, an hour and thirty minutes are taken up with radio lessons. Eighty percent of these lessons are for all three grades. For the other three hours and thirty minutes, the teacher directs the class with work activities initiated by the radio. The classroom teachers receive beforehand a document called the "Correo de Radioprimaria", a mimeographed bi-weekly that

contains the detailed schedule of radio classes for two weeks. It also contains directions about activities for the teacher, or students, or both, to do before, during, and after the radio broadcast. It suggests teaching material that can be made or that should be on hand for each lesson. At times, the teachers receive visual materials, maps, and pictures produced in color by DGEAD.

Many of the classrooms are of the prefabricated type that is spreading in rural Mexico. These buildings are well-lighted by two walls of windows, in contrast to the older buildings that have few windows and are dim even in daytime. Generally a portait of Juarez hangs in front, and some DGEAD materials, charts or maps, are commonly found even in very rural areas. All rooms have a blackboard. The benches are made for two students, and are generally filled. There is no heat, and winter days can be chilly.

While there are no special printed materials provided for the students in the radio classes, the radio-lessons follow systematically and constantly refer to the free textbooks (<u>textos unicos</u>) given by SEP to all Mexican primary school children.

What makes the Mexican situation interesting is that the use of radio there is trying to stretch the efficiency of the rural teacher, so that with basically the same number of teachers plus radio more children can be offered the full six grades of primary education.

CHAPTER TWO

How Does Radioprimaria Work?

How well does radioprimaria meet its first goal: to bring more, complete six-year schools to the rural areas? How is this goal being met? What difficulties come up because of the way radioprimaria is organized in San Luis Potosi? How many children are now in school because of radioprimaria?

In June of 1970, there were seventy schools with less than six grades in the three federal school zones of San Luis where radioprimaria came to be implemented. These, of course, are precisely the schools for which radioprimaria was intended--the incomplete schools. But only eight of these seventy incomplete schools used radio over the next two years, and one of these eight dropped radio in September of 1972. Table Four lists these eight schools, and shows the enrollment changes and the number of children in new grades.

At the end of June 1972, the primary schools in these three zones enrolled 21,107 children, with 2020 fifth and

TABLE FOUR
Children in grades created since the introduction of radioprimaria

School	enrollment 1970	enrollment 1972	children in new grades in 1972	6th grade grads in two years
Angostura+	146	161	7	12
Mantequilla	94	156	33	15
Mezquital	104	191	30	13
Tercera Chica	90	184	41	17
Laguna de Sta. Rita	156	238	39	18
Jaral*	71	144	28	24
Ojo de Pinto	85	138	42	23
Corte Segundo	198	254	20	52
TOTALS	944	1466	240	179

+ Angostura was down to five grades again in September 1972.
* Jaral had six grades in 1967,1968, and 1969, but the statistics are blank for fifth and six grades in 1970. Enrollment in the three previous years was 132, 160, and 135 respectively. Possibly the 1970 statistics were lost.

1563 sixth graders. Children in new grades in radio schools numbered 240 (123 in fifth grade and 117 in sixth grade). The increase for these two grades from the introduction of radioprimaria was seven percent.

Interesting to note is the fact that, of the forty-four schools in the three federal zones that had six grades in 1969-70 (the year before radio was begun), thirty-six of these were using radio by June of 1972. While radio may be a useful supplement in these complete schools, they do not fit the criterion for which the system was started. That is to

say, eighty-two percent of the schools using radio do not fit the criterion--they are not incomplete schools--for which radioprimaria was started. It is not uncommon that innovations are used most by those who really need them this stands as another instance of that.
least--radioprimaria stands as another instance of that.

Furthermore, there remain important hardware and administrative problems in San Luis Potosi. On the hardware side, radioprimaria depends on radio receivers that are bought and maintained by the teacher and/or the community. (Usually the teacher--the teacher questionnaire, which will be discussed more thoroughly later on, showed that in three of four cases, the radio was bought by the teacher.) When electricity is lacking, or the batteries run down, or hills obstruct reception, or classroom acoustics are poor, or radio speakers are squawky, the children do not benefit. In some schools, haphazard maintenance hinders continuity in the radio classes. The lack of some central agency to insure receiver quality becomes a felt need for anyone who visits the radio schools. There have also been problems with the one tape recorder at XEXQ. All of Wednesday and part of Thursday, November 15 and 16, were missed when the tape recorder broke down. (A new machine was brought up from Mexico on November 25.) XEXQ was planning to install a more powerful transmitter in November to widen its listening area. This would increase its power from 250 watts to 1000 watts, and its prime listening area from twenty kilometers to sixty. But not all the new equipment had arrived by

December 15, and the improvements had yet to be made.

Administratively, radioprimaria has its most critical problems. Each school zone has its own inspector, who is charged with visiting the schools regularly. Yet the inspector is not provided with a vehicle for this travel, or, as far as one could tell, expenses to maintain his own car. The countryside is very rough on a car, so that maintenance expenses are higher than normal. To inspect the most rural of the approximately fifty schools in his zone, an inspector would have to drive two hours one-way, though other schools would be closer. In three and one-half months of visiting schools, we crossed paths with an inspector only in Saucito and Garita de Jalisco, two schools that are very close to San Luis Potosi. This could have happened by chance, but more likely the inspectors were not doing extensive visiting. One inspector is also the presidente municipal of Soledad Diez Gutierrez (pop. 30,000), and that office demands the majority of her time.

The vehicle available for the Federal Office of Primary Education belonged to the Federal Director, Prof. Nunes. But he has so many duties in San Luis and Mexico City that

systematic supervision of even the one hundred thirty-four federal primary schools in these three zones is out of the question, and there are thirty-two other federal zones in the state. This study was made possible by the fact that it had its own vehicle.

In the first year of radioprimaria in San Luis Potosi, the Director of the Audiovisual Center made extensive visits, using his own car. In this way he was able to see the precise classroom situations and promote the use of radioprimaria. These visits remain the basis for the whole radioprimaria program, and were the major factor in the initial acceptance of radioprimaria. They represented the most effort made to communicate to the teachers that there was such a thing as radioprimaria and to explain how they might use it. This work stands out as the principal difference between the relative stability of radioprimaria in San Luis and the failure of radioprimaria in the Valley of Mexico (cf. below).

But those visits were done gratuitously, and the car used is no longer serviceable except for the city. In the visits this year, it was found that some schools were not using radioprimaria because the old teacher had been transferred and the new teacher knew nothing about radioprimaria. Radioprimaria needs a great deal of supervision, as does all rural education. This is not just to check up on the

teachers; it is principally to give them encouragement and advice, and in general to maintain communication within the system. But radioprimaria has no such supervision on a formal basis. The audiovisual director did much of it the first year, but it was not strictly his job and now he has no vehicle to continue. The fact is, it was learned, that DGEAD has not spent any money in San Luis for this radioprimaria project. No one has been hired in any capacity. Radioprimaria teachers receive no bonus, nor is the purchase and upkeep of the radio subsidized.

The administrative priority should be for some sort of supervision. Neither the visits that were made two years ago by the Audiovisual Director nor this year's visits were planned by DGEAD, and they will not occur again. If the system is to be maintained, it needs formal supervision on a regular basis. Teacher turnover in any particular school is rapid (more than seventy percent of the teachers have been in their present position for three years or less), so that if continuity in radioprimaria is to be kept up these new teachers need encouragement and instruction in what radioprimaria is.

On June 2, 1972, the director of DGEAD wrote to the director of radioprimaria, in reference to the radioprimaria project that by then had been going on in San Luis Potosi for two academic years. "In the case of

radioprimaria, we believe that the original objectives of experimentation in the rural area on a small scale have been fulfilled; therefore, it is necessary to move to the next step which involves the restructuring of radioprimaria under the name Ayudas Radiofonicas para las Escuelas de Organizacion Incompleta (Radio Aids for Schools with less than Six Years), a project over which our organization will have charge...." (courtesy of Profa. Minerva Gil) But when the leaders of DGEAD talk about initial objectives being fulfilled, what criterion is being used? The DGEAD director's letter implies that some criterion was used, and, in fact, met.

It seems that the criterion came from the past history of radioprimaria, particularly from its failure in the Valley of Mexico and the Federal District during the 1969-70 school year. Twenty-nine schools were involved there, but the experiment did not continue. The head of the Technical Department of DGEAD analyzed some of the reasons for what happened. In his view, there was no systematic supervision of the radio schools (either by DGEAD or by the local education staff) owing to the preoccupation with radio production, the selection of themes, the writing of scripts and the Correo, and the designing of visual aids. He visited some of those schools at that time, and found that the teachers did not follow the radio classes. Among the reasons that he noted were:

1. tnere was a lack of information from the Department of Radioprimaria;

2. some teachers had thought that the radio receivers would be distributed free;

3. there was a neglect on the part of school directors and teachers who did not take the project seriously;

4. there was poor signal reception at times, due to a faulty transmitter;

5. some teachers saw radioprimaria as an additional task in their daily work;

6. some teachers who commuted from Mexico City could not arrive in the schools by eight in the morning (when the broadcasts began) so they did not listen.

According to this official, "...for these reasons, we believe that the only objective which we realized at this stage was the training of the classroom radio teachers in writing scripts and taping lessons....In my opinion, the basic error at that time was the failure to coordinate the activities of radioprimaria with the school authorities of the Valley of Mexico and the Secretariat for Public Education. The result was that most of the teachers did not take the radio lessons seriously." (Personal letter of September 26, 1972)

Therefore, the experience in the Valley of Mexico seems to have provided the de facto criterion of survival for

the radioprimaria project in San Luis Potosi. Whereas DGEAD's technical head found a failure in the Valley of Mexico to coordinate the radio program with the local education authorities to insure teacher interest, in San Luis Potosi the DGEAD people have received excellent cooperation from the Federal Director of Primary Education and particularly from the Director of the State Audiovisual Center, Prof. Vito Tristan Benitez. It has been the audiovisual director, Prof. Tristan, who has convinced teachers, one by one, to use radioprimaria. DGEAD officials have been too far away in Mexico City to do the supervision of the project. They could not provide the day-to-day visiting that makes a rural teacher feel part of something important and that can see that the system functions well. But this local audiovisual director and his assistant have visited schools to encourage the use of radio. They convinced enough teachers so that the system could get off the ground. Programs were written and taped, the tapes were delivered to San Luis Potosi and broadcast, the Correo went out, and the teachers seemed to be using radioprimaria in their classes. The system became operational.

While DGEAD never stated this criterion, in fact it is the basis for saying that the original objectives have been fulfilled during the first two years. No evaluative studies

were done. Learning data is now available and will be discussed in a later section, but it was not available in June 1972. Data on the number of schools brought up to the full six grades was in the archives, but was not organized until the fall of 1972. There had only been an increase of seven percent in the grades that have been augmented by radioprimaria.

As in the beginning stages of many projects, the stated goals remained in the background until the system became operational. This occurs frequently with communications projects, whose initial technical and hardware demands are so formidable. Therefore, it becomes necessary for any evaluation team to emphasize that an operational system is not necessarily a successful system--without demeaning the heroic work involved in putting the operation on its technical feet. Given its limited resources, DGEAD may have been justified in delaying its evaluation and in using the criterion of survival for the first two years. Hardware and administrative problems have a way of obscuring the real social goals of communications projects, even when those goals have been thought out and stated beforehand.

Summary

How does radioprimaria work? Two basic realities are found to be underlying the situation. First, SEP began

radioprimaria in San Luis Potosi without investing any money there. Through chance, the local audiovisual director was able to visit the rural schools in 1970 to get radioprimaria underway and through chance this present study allowed him to visit the schools in 1972 again, to patch up the system. But without regular supervision, the radioprimaria system will run down badly. Radio receivers need more quality control from some central source. Both these administrative and these hardware problems demand some investment from SEP. Radioprimaria cannot continue in the rural areas without these investments.

The second basic reality is that there has been no sustained effort to focus radioprimaria on the incomplete schools. Only seven of the seventy incomplete schools have been brought up to six grades, while thirty-six of the forty-four radio schools already had six grades before radioprimaria began. It seems that DGEAD leaders feel that radioprimaria has moved past the experimental stage simply by surviving, and that a previous failure of radioprimaria in the Valley of Mexico explains why this criterion has been used.

CHAPTER THREE

Observations of Radioprimaria

October and November were spent observing in the schools, both those with radio and those without radio, to see if schools were operating and using radio, and to observe teacher and student attendance. These visits were not intended as pedagogical evaluations, but as a way to see how extensive was the use of radioprimaria in the schools that said they used it. The inaccessibility of the rural area makes the rural teacher very much his own man, particularly when any type of inspection or supervision is absent. By listing all the radio schools in random order and dropping in on them unannounced, it was possible to get a cross-section look at the radioprimaria system. Visits were also made to nine direct teaching schools, to see what the categories "radio school" and "non-radio school" really meant.

This design had the built-in insistence of taking the day of the visit as a typical day. In one school, for example, radioprimaria was not being used because the Correo had not

been picked up, but it is known from a later visit that radioprimaria was resumed there. Another school, however, stopped using radio after November 6, because the teachers there did not think it was useful; it had been visited in October. Since visits went in random order, it was felt that some schools were found on good days and some on bad days. These data are not to be applied to individual schools; they give the situation of a typical day in the radioprimaria system as a whole.

Were the teachers there?

First, were the schools open? The attendance by the radioprimaria teachers was excellent on the whole, and all but one of the radioprimaria schools were open. (Appendix A tells which schools were open, which were using radio, and how many children were present or absent from the classes we visited.) Some schools start late much of the time, either because the teacher comes late from the city or he does not insist on punctuality from the students. While we sometimes visited two schools in a day and so did not arrive at nine o'clock in both, perhaps fifteen to twenty percent is a fair estimation of how many schools miss the first half-hour due to lateness on the part of teachers and/or students.

Of the nine non-radio schools visited, only four were even open. Can radio be given the credit for this better showing by schools with radio? It is impossible to say. It

should be remembered that thirty-six of the forty-four radio schools on this list had six grades before the introduction of radio. The more grades the school has, the more teachers it has, and the more teachers it has, the more likely it is to be open. Yet of the five closed non-radio schools, two have six grades. Certainly the data do not detract from radio, and they do seem to support Prof. Tristan's speculation that the daily continuity in the radio classes makes it more necessary for the classroom radio teachers to come every day.

Student attendance levels seemed acceptable. Five out of six of the enrolled children were there. Some students come quite late in schools where this was plainly the custom. Not enough non-radio schools were observed to say which system had the more tardiness. Figures were not gathered from all the schools because some were closed, some had no upper grades, some were visited only briefly because they were not using radio.

Radio use

The more striking item--and the item that should be stressed above all--is the spotty use of radio in the "radio schools." Eighteen of the forty-four schools visited were not using radio on that particular day, while twenty-five schools were using radio, and one school was closed.

Eighteen of the radio schools were not in fact using

radio. Why was this the case? Often the radio was broken, or the electric power had failed. Sometimes the teacher was new and not willing to use radioprimaria. In one place, the teacher and the community could not agree on who would buy the radio. Some teachers were just not convinced that radio would be helpful to them.

Of the twenty-five schools found using radio, seven had radios that were not audible. In two cases, the teachers told the students that they would not be able to hear, and then relayed the lesson from next to the set. The reception problem is widespread. Maintenance of the radio involves getting funds from the community. Small radios and old stone-walled classrooms make hearing in some back of some classes difficult even when reception is clear and the radio is in good repair.

Therefore, the radioprimaria system when observed by us in this random way had only eighteen schools with an audible, functioning radio--eighteen out of forty-four.

Observations of the schools provide evidence of how the system can run down without supervision. Prof. Tristan was only able to visit these schools because this research happened to be going on. It has been up to him to convince teachers to use radioprimaria, and he had done that two years ago when he visited the schools in his own car. But now many of those teachers have changed schools, and with no

car he is not able to get into the rural area in the way that is needed to maintain the convictions and enthusiasm of the teachers.

With teachers soliciting changes and being changed so much during the first weeks of school, preparation ahead of time is out of the question. One teacher was working his first day at a school visited on October 30. Continuity with the radio lessons from year to year suffers. The number of schools using radio has dropped each year. (Appendix B list all the schools in reference to their radio use.) In 1970-71, there were forty-nine radio schools; forty-four in 1971-72; and there are thirty-seven in 1972-73. Schools move in and out of the radioprimaria system. This reflects the difficulties in organization and supervision, and the movement of teachers within the system. These difficulties have caused the system to run down--approximately a twenty-five percent drop in two years.

One of the principal reasons for these changes is that most rural teachers want to be transferred to the city, or closer to the city--as will be seen in the next section. The Federal Office of Primary Education is filled with teachers soliciting changes all during September and into October, while classes go untaught in the rural areas. When these changes are granted, a new teacher is sent into the rural area with no experience in that particular school and with a late start.

Visits to the schools also brought out other difficulties. Student lateness is bad in some places, especially where it is clearly tolerated by the teacher. Children coming in till 10:30 was common in several communities; they can hardly take advantage of the radio lessons. In other schools, virtually all the children were in their places at the start of the school day. Evidently tardiness is something the teacher can do something about--another of the struggles that the rural teacher must face.

The transmission of the radio classes is not always prompt, sometimes as much as ten minutes late. This keeps the classroom teacher in suspense, and wastes time.

Finally some comment should be made about the observations of the classes themselves, and in particular about the classes intended for only one group. An example would be a history class where the radio class is directed only at the fifth grade; the fourth and sixth graders are given a reading or workbook assignment to do on their own. Though only two of the fifty-six classroom radio teachers who responded to the questionnaire said that these non-listeners waste time "almost always" and only fourteen said they waste time "at times", these students did not show a great deal of concentration at these times.

Summary

These observations showed that the radio schools are open. Yet only eighteen of the forty-four schools have an audible, functioning radio. This is an important finding, and is precisely the kind of datum that could only be observed by a supervision team. The visits, while spread over many days, provided a view of one typical day in the life of radioprimaria. Certainly before we can ask about effects, the point has to be made--with emphasis--that on these visits more than half of the radio schools were found to be not functioning.

While teacher and student attendance in radioprimaria is good, the actual use of radio was very spotty indeed. Just the technical task of getting the radio signal into the classroom remains a major difficulty, and tardiness is a serious problem in some places. It does not appear soluble through the goodwill of the teachers alone. More organized supervision of the reception problem--particularly receiver quality and maintenance, but also teacher motivation to use radio--will have to be implemented if these schools can be called radio schools.

The observations basically showed the variety of situations that have been grouped under the heading "radio schools".

CHAPTER FOUR

The Achievement Tests

Tests were given to all the schools in the three school zones that had a sixth grade. Six hundred ninety-six of these students were in the radioprimaria schools, and five hundred forty-three were in direct teaching schools. Only the sixth grades were tested, to gather scores those radioprimaria students who had used the system for three years. The tests covered Spanish and arithmetic, and were given twice, once in September and once in December. In this way, we had scores for both groups on two dates and we could compare the changes (if any) between the two dates for both groups.

For maximum reliability, the tests were administered by a group of six persons trained for the task.

The tests themselves were taken from a booklet of tests prepared some years before by SEP. After pretesting the tests in August on a group of sixth graders in the city of San Luis Potosi, a mixture of items was found that promised to give a good distribution of scores. For Spanish, the test

was made up of three readings, each reading followed by a set of multiple-choice questions--fifty-one questions altogether. The three readings were taken from fourth, fifth, and sixth grade tests respectively. In arithmetic, the grade level had to be lower; many fifth and sixth grade items proved too difficult in the pretest, so the final version consisted of third, fourth, and fifth grade items. (Both tests are listed in Appendix C.)

Each test took an hour, and there were thirty-eight items in arithmetic and fifty-one items in Spanish.

Table Five shows the results for both groups on both tests in September and December, and Table Six gives the breakdown of arithmetic tests by section.

TABLE FIVE

Means and gain scores in arithmetic and Spanish for radio and non-radio schools in September and December

Subjects	Radio classes (N=696)	Non-radio (N=543)
Arithmetic		
Mean score, September	15.7	20.3
Mean score, December	19.0	23.2
Gain	3.3	2.9
Spanish		
Mean score, September	26.4	30.1
Mean score, December	30.1	32.4
Gain	3.7	2.3

(Differences between September and December are all significant beyond the .001 level .)

TABLE SIX
Means and gain scores in arithmetic (notions and concepts, computations, and problems) for radio and non-radio schools in September and December

	Radio (N=696)	Non-radio (N=543)
Arithmetic --notions		
Mean score, September	8.66	10.05
Mean score, December	9.91	11.09
Gain	1.25	1.04
Arithmetic --computations		
Mean score, September	6.09	8.83
Mean score, December	7.87	10.37
Gain	1.78	1.46
Arithmetic --problems		
Mean score, September	0.91	1.40
Mean score, December	1.36	1.71
Gain	0.45	0.31

One immediate question: why do the non-radio children start higher than the schools that use radioprimaria? The answer appears to lie in the fact that more of the children in the non-radio schools live closer to the city. The non-radio schools include three large schools whose students made up approximately forty-two percent of the non-radio children; the means for each of these schools were well above the general mean. These three schools were located

very close to the city of San Luis Potosi. They had better facilities than the genuinely rural schools, were very accessible to the city, and averaged seventy-eight children in their sixth grades. Tests were given in all the schools in these three school zones that were classified as "rural". But, in reality, some schools were more rural than others,

TABLE SEVEN

Means and gain scores in arithmetic and Spanish for radio and non-radio schols in September and December, with three non-radio schools removed

Subjects	Radio classes (N=696)	Non-radio (N=543)
Arithmetic		
Mean score, September	15.7	17.5
Mean score, December	19.0	20.3
Gain	3.3*	2.8*
Spanish		
Mean score, September	26.4	28.3
Mean score, December	30.1	30.1
Gain	3.7*	1.8**

*These gain scores are significant beyond the .001 level.
**This gain score is significant beyond the .025 level.

and some schools were not rural at all. The classification had not caught up with the growth of the city. Some children had hardly any contact with the city while other children could walk or bicycle there very easily. These schools had some advantages over the more rural schools. Since these three schools raised the mean score for the non-radio schools, it would be useful to look at the scores for the

non-radio schools when these schools had been removed from the group. Table Seven shows these scores, in comparison with the radio schools; it becomes evident that the initial headstart of the non-radio schools has all but disappeared.

What about the schools that fit the original criterion for radio schools--those schools that did not have six grades before the introduction of radioprimaria? How did they score in relation to all the radio schools as a group? It must be noted that since all the radio schools did not lack six grades before the introduction of radio--in fact, thirty-six of them did not--to compare the radio schools and the non-radio schools directly is not an exact comparison of matched groups with one controlled variable. The next table, Table Eight, gives the scores for the seven schools that did not get six grades until the introduction of radioprimaria and the scores for all the radio schools together.

TABLE EIGHT

Means and gain scores in arithmetic and Spanish for all radio schools and for radio schools with new sixth grades, in September and December

Subjects	All radio classes (N=696)	Radio classes with new sixth grades (N=111)
Arithmetic		
Mean score, September	15.7	16.8
Mean score, December	19.0	18.7
Gain	3.3*	1.9**
Spanish		
Mean score, September	26.4	26.6
Mean score, December	30.1	30.0
Gain	3.7*	3.4***

*These gain scores are significant beyond the .001 level.
**This gain score is significant beyond the .025 level.
***This gain score is significant beyond the .005 level.

It would be hard to find scores much closer. The radio schools that have new sixth grades do not form a group that is different from the larger population of all radio schools.

Radioprimaria shows that it can be a useful teaching aid, and that it can assist in bringing this level of education to rural areas. It has not hindered learning, but has produced scores that are comparable to those of the children in direct teaching schools. While the findings are encouraging, it must be noted again that this was hardly a well-controlled experimental situation. The majority of the radio schools--as has been mentioned--had six years of schooling before radio was introduced. Many of the direct teaching schools have fourth, fifth, and sixth, or fifth and sixth grades in the same room. The breakdown of the schools tested can be seen in Table Nine.

TABLE NINE

Grades in one room in the radio and non-radio schools

Grades	Radio	Non-Radio
6th	6	9
5th and 6th	15	2
4th thru 6th	5	9
3rd thru 6th	2	1
2nd and 6th	1	0
TOTALS	29	21

The different circumstances of so many children and the lack of a controlled situation must come into the interpretation of this learning data. It cannot be said that these two groups were matched except that one group used radio and one group did not. This was not the case. Basically all that should be concluded is that radio children were not hurt by trying to learn from radio (they did about as well as the other children), and that there is no reason to say that radioprimaria cannot do what it was designed to do: bring more years of primary education to more rural areas. It is particularly the data on the seven schools that now have six grades since the introduction of radioprimaria that provide a basis from which to make even these tenuous conclusions.

Summary

The main finding from these learning tests seems to be that radio classes can indeed supplement direct teaching as a learning tool, and that the type of rural education that is given by a teacher can be given to a larger group or groups of children with radio as a teaching aid to the teacher. The hope was, in designing radioprimaria, that the type and quality of rural education presently being given in only a few parts of Mexico could be given in more areas through the use of radio and without increasing the number of teachers. It seems that this can be

done. It seems advisable, however, to try to get firmer data about learning by a more-controlled and genuinely experimental assessment of the *radioprimaria* system.

CHAPTER FIVE

The Costs of Radioprimaria

by Steven Klees

In Table Ten, estimates are presented of the costs of the system. The assumption on which these cost estimates are based are detailed in the footnotes to the table. The Total Annual Cost of the system is presented in equation form as $37,880 + $.1176 x N. For the small number of students presently in the system, unit costs are relatively high compared to what they potentially could be with more students in the system. With only 2800 students, the cost per student is $13.60, while with 100,000 students, the cost per student would go down to $.4800. In terms of the cost per student hour of programming, the system seems relatively inexpensive even at present.* Assuming 233 hours of programming per year are directed at the average student,** with 2800 students in the system, the cost per student hour is $.0584 (with 100,000 students, the cost would be $.0024 per student hour).

Radioprimaria was conceived of, in part, as a less expensive method than Direct Teaching of providing six grades of primary schools in rural areas. Table Eleven examines this under somewhat hypothetical conditions. We assume the choice facing the SEP is whether to take (on the average) 45 students in a rural community and give them fourth, fifth, and sixth grade education in three classrooms with three teachers (assume over time an average of 15 students per grade), or to put them in one classroom with one teacher and one radio for three years. Even if enough primary school teachers could be found to teach in these rural communities, Table Eleven shows that following this alternative would be a much more expensive proposition than radioprimaria. This is obviously due to the fact that three grades in one classroom with one teacher cost less than having each class separately. The differential cost between the two systems of $65 ($118-$53) represents the cost saving per student of using radioprimaria to cover three grades as opposed to Direct Teaching. This differential cost would be even greater if there were more students in radioprimaria because the fixed production and transmission costs could be spread over more students.

There appear to be a number of problems with the rural primary school system overall, mainly in terms of lack of central administrative support, both financially and

psychologically. However, as this is a problem in both Direct Teaching and radio schools, the analysis of differential system costs still stands. If the radioprimaria system were to be extended through the country, costs may be somewhat higher than those shown in Table Ten and Table Eleven because of higher transmission costs. It is probable that broadcast time, if leased from a commercial radio station, would be more expensive than that computed by the University of San Luis Potosi radio station, but this would most likely be more than offset (in terms of cost per student) by more students in the system. Ultimately, of course, whether or not the lower cost of radioprimaria makes the system worthwhile depends on its relative pedagogical effectiveness.

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*For comparisons with other radio projects, see Jamison, Dean, with Steven Klees, The Cost of Instructional Radio and Television for Developing Countries. Stanford, Calif.: The Institute for Communication Research, 1973.

**There are about 270 total hours of programming per year. However, given that about 80% of the programs are directed at the combined fourth, fifth, and sixth grade audience and the remaining 20% distributed among the three, we can calculate that the average number of hours directed at a student in any particular grade is 233.

TABLE TEN
Cost of Program Production, Distribution, and Reception for Radioprimaria (in 1972 dollars)

Cost Component	Annual Cost (1)
1. Production Costs	
Radio teachers, personnel and Administration (2)	$28,000
Studios (3)	$ 1,304
Studio Equipment (4)	$ 2,704
Audio Tapes (5)	$ 226
Maintenance (6)	$ 1,680
2. Distribution Costs	
Transmission Operations (7)	$ 3,836
3. Reception Costs (8)	
($0.117 x N) (number of students in 1972 = 2800)	$ 329
TOTAL COST	$38,269

N.B. Average Cost Per Student if N =	2,800	$13.60
	5,000	7.68
	10,000	3.92
	50,000	.88
	100,000	.43
	1,000,000	.16

(1) Capital costs are annualized using a 10% social rate of discount. See Jamison with Klees (1973) for more details on methodology.
(2) Although there were more production personnel and radio teachers in previous years, the present group receives higher salaries so that expenditures over the past two years have been about this figure. If the present rate of program revision is maintained, this appears to be a fairly firm estimate of future costs.
(3) The two studios and one control room cost approximately $8,000 to construct and are annualized over an assumed

10-year life. To the extent that the studios are used for purposes other than radioprimaria, this estimate overstates the cost.

(4) The studio equipment was costed at $10,600 and is also annualized over a 10-year life. To the extent that the studio equipment is used for purposes other than radioprimaria, this estimate also overestimates the cost.

(5) Audio tapes were priced at $6.80 for an hour length of good quality. This is annualized over a 10-year life expectancy given the need for a stock of 270 hour long tapes (since they broadcast about 270 tapes per year). Although DGEAD has, in reality, a larger stock of tapes, these are generally used to make copies of radioprimaria programs to send to commercial stations throughout Mexico that request them. Therefore, the expense should not be charged to the radioprimaria experiment in San Luis Potosi.

(6) This is assumed to be 10% of the value of the studio equipment.

(7) This figure was obtained from the University radio station at San Luis Potosi. They estimated a cost to the station per hour of broadcast to be $14.4264. It is assumed that there are 270 hours per year broadcast. This cost is not incurred by DGEAD.

(8) Radio receivers are assumed to cost $20 and are annualized over a five-year lifetime. Since the total stock of radio receivers in the system is variable with the number of students, the cost of receivers is given as a cost per student figure (assuming an average class size of 45).

TABLE ELEVEN
The Annual Cost Differential per Student between
Radioprimaria and Direct Teaching (1)

Traditional Components	Direct Teaching	Radioprimaria
Administration	same	same
Classroom Teachers (2)	$96	$32
Facilities --fully equipped classroom (3)	$22	$ 7
Student Costs -- books, supplies, etc.	same	same
Sub-Total	$118	$39
Educational Radio Components (4)		
Production	---	$12.16
Distribution	---	$ 1.36
Reception	---	$ 0.08
TOTAL COST	$118	$52.60

(1) This analysis does not estimate the total cost of either system, but only attempts to allow the reader to determine the difference in cost between the two systems, given that both systems are trying to educate the same group of students. Administration and Student Costs are assumed to be the same for both systems. As radioprimaria was developed for rural communities with incomplete primary schools, the average size class is assumed to be 15. The Direct Teaching method is assumed to use three teachers and three classrooms with 15 students per class. The radioprimaria teaching method would use one teacher, one classroom, and one radio for 45 students.
(2) The assumed primary classroom teacher salary is $1440 per year.
(3) The cost of a rural primary classroom was assumed to be $2800 annualized over a twenty-year life with a 10% interest rate. This estimate was obtained by halving the classroom cost estimate made in an untitled report by the Federal District on public expenditures for September 1968 to August 1969. The estimate was halved to be more representative of the cost of rural classrooms as opposed to urban ones.
(4) These figures assume the 1972 student enrollment of 2800.

CHAPTER SIX

The Teachers' Questionnaire

A seventy-five item questionnaire was designed; it was not only for the classroom radio teachers, but for all teachers in the three school zones under study. Seven pages long, it took about thirty minutes to fill out (the entire questionnaire with the results for each item can be found in Appendix D).

Of the approximately three hundred questionnaires that were distributed, two hundred thirty-one, or seventy-seven percent, were filled out and returned. Fifty-six of these were from the eighty-four classroom teachers--sixty-seven percent.

The larger group of teachers

First, taking all two hundred and thirty-one teachers. A great deal of transience was found among the teachers--they do not tend to teach in one place very long--and that the vast majority of the teachers do not live where they teach. Fully seventy percent of these teachers have been teaching in their present location for only three years or less. Even more, seventy-eight percent, do not live

in the community where they teach. Basically teachers are not rural people; even if they are born in the rural area, their training in the urban Normal School opens them to the style of city living.

According to an estimate by Prof. Nunes, the Federal Director of Primary Education, ninety-five percent of the rural teachers would prefer to teach in the city. So the teachers were asked this question: I prefer to teach in the rural area rather than in the city--yes or no? Twenty-nine percent said "yes", they preferred rural teaching; forty-three percent said "no", they preferred the city. And, interestingly, twenty-seven percent gave no answer. Many teachers seemed to tiptoe around this question. Did they feel that their anonymity might not be secure, that to say they preferred a move would jeopardize their job or that to express satisfaction in the rural area would keep them there indefinitely? Prof. Nunes notes that young teachers accept rural posts for a few years, but then insist that they have a job in the city. The inconveniences of rural life, he says, cause many teachers not to teach at all. One effect of improved roads in the area has been the exodus of the teachers, the most educated persons in the community, from the community to the city. Many rural teachers force themselves to stay in the rural schools, but they are thinking about their families who live in comfort in the

city, says Prof. Nunes; this hurts the quality of rural education (El Heraldo de San Luis Potosi, Aug. 20, 1972).

The focus of these commuter teachers, then, is on the comforts and their families in the city. They do not have other jobs for the most part (eighty-six percent do not), but they are not content teaching in the rural area.

The value of rural education

A series of questions about the value of rural education brought some puzzling results, contrasting with parents' views of rural education (described in the next section). Ninety-one percent disagreed that "learning, frankly, has no value in the rural area"; the teachers seem to feel that schooling has some payoff there. Yet seventy-six percent agreed that it is better for a child with primary education to move to the city.

Eighty-five percent agreed that education is the most important factor for the development of the rural areas, and eighty-eight percent agreed that the rural teacher contributed a great deal to the development of Mexico; yet eighty-eight percent also disagreed that the only role for primary school is to prepare children for secondary school. The teachers imply that the primary education in itself has some value in the rural areas, even though they did say it was better to go to the city. This view is not shared by parents or by labor leaders--as later sections will

describe. The teachers have a much more optimistic views of what education can do for the rural areas.

As to whether education will solve rural needs, forty-one percent agreed that it will not, but thirty-seven percent feel that it will. The question is baldly stated so that these thirty-seven percent of the teachers are saying that all the rural areas need is more education, and then rural problems will be solved. They see education as the solution.

Teaching as a profession

How do they feel about the teaching profession? Sixty-one percent said, indeed, it was a satisfying profession, but twenty-three percent--nearly one out of four--said it was not. Forty-eight percent said they would not encourage their brighter students to become teachers; one out of three teachers said he would. Forty-three percent said they would continue teaching even if a better-paying job was available elsewhere; thirty-five percent said they would take the other job.

The teachers do not seem enthusiastic about their jobs, as a group. The forty-three percent who would turn down a better-paying job to continue teaching are probably the most dedicated and happiest of the group in their work. A large percentage of the teachers, however, are not that committed and would work elsewhere if they could. Teachers' pay is

low, beginning at around 1500 pesos ($120) a month. Even after eighteen years, one teacher told us, he is only receiving 1900 pesos ($152) a month.

Supervision

Finally a note about the teachers' felt need for more supervision. Fifty-nine percent felt little or no need for more teacher supervision, while thirty-five percent said they did feel such a need. When the question was phrased differently--"the rural teacher is isolated, does not receive enough attention or supervision"--thirty-seven percent agreed with that, and forty-five percent disagreed. The teachers clearly do not feel as strongly about the need for more supervision as we do; but, of course, their perspective on the whole system is different. They may see supervision only as a threat to their way of teaching, and not consider its advantages to the system as a whole.

The classroom radio teachers

Did these fifty-six classroom radio teachers feel that it would be better to teach without radio? Forty-three percent said said it would be better without radio, while forty-five percent felt radio made the teaching situation better. Their enthusiasm is hardly unbounded--one out of eight did not know what to say to this question. Therefore, it could not be justified being said that radio automatically captivates the teachers. Teachers had to be persuaded to use

it, and close to half seem to remain unconvinced.
This same question was asked in a slightly different form: Is the use of radio as a teaching aid better than direct teaching alone? Forty-eight percent said it was, forty-six percent said it was not.

Only ten percent of the teachers felt that the classroom teacher gave up some of his authority to the teacher on the broadcast. Eighteen percent felt that radioprimaria lessened the classroom teacher's importance, and twelve percent agreed it hindered the teacher-pupil relationship. Other potential problems were also mentioned, but only by a relatively small percentage of the classroom radio teachers.

The problems that stand out from the teachers' responses relate to the clarity of the signal and the speed of the programs. Several questions touched on each of these points, and a certain consistency came through.

Sixty-four percent of the classroom radio teachers replied that lack or clear radio reception was a serious or very serious problem. To a similar question, forty-six percent replied that the signal at their school was clear "almost never" or only "at times". Yet they placed the blame not on their radio but on the transmitter--because almost three of four said their radio worked well all the time or almost all the time. (Remember that seventy-five percent of the radios belong to the teachers personally.) It may be

that the almost even split among the teacners for and against radio is based partly on these reception difficulties. The radio programs are not always clear, they say; perhaps many teachers look on radio as somewhat problematic, not a sure thing, and at times an added difficulty for them. Certainly the observations in the schools showed that reception is a genuine problem.

Fifty-five percent said that the speed of the programs is a serious or very serious problem. Eighty-four percent replied that radioprimaria is too fast at least at times and two out of three teachers felt that "at times" or "almost always" radioprimaria leaves too little time for classroom activities. Even more teachers said arithmetic needs more time after the broadcast--eighty-two percent said this--and sixty-one percent said language classes needed more time after the broadcast too. In addition to the speed, the broadcasts are too close together, say these teachers. They find too much content in the programs; eighty-one percent of them said that, at least "at times", radioprimaria has too much content. Fifty-four percent replied that lack of student attention was a serious or very serious problem.

These teacher opinions bring out definite problems within the radioprimaria system. The technical problem of radio reception can be remedied in a fairly straightforward

way, but the questions of speed and content are more subtle pedagogical ones. There may be some relation, however, between the two. Programs which cannot be heard well discourage attention and assimilation; the perceived content becomes greater when it is more difficult to understand. As in listening to a foreign language at first, it seems so fast and so complex because it is poorly understood.

Expand radioprimaria?

Seventy percent of the responding classroom radio teachers agreed that radioprimaria was good and should be expanded. Since less than half had felt that radio was better than direct teaching, this seventy percent may indicate that the teachers realize that direct teaching will not be able to do the job--it is too expensive. They realize that something else must fill in for the lack of teachers and think that radioprimaria may be that something. And they as teachers evidently find it somewhat helpful for themselves. Eighty-two percent replied that the radio classes helped them with their own teaching methods; and, to another question, again eighty-two percent said that radioprimaria has helped them to organize their own work. They find the Correo understandable and obviously helpful to them in organizing their daily work in front of several groups. Evidently some of the most important beneficiaries of the radioprimaria system are the teachers themselves.

The positive feeling reflected by the teachers' questionnaires contrasts favorably with the skepticism of the teachers in the radioprimaria experiment in the Valley of Mexico. The added communication to the teachers and the school visiting by Prof. Tristan seem to be precisely the factors to account for this; there was no person comparable to Prof. Tristan in the Valley of Mexico where radioprimaria failed to endear itself to the teachers. In San Luis Potosi, while the teachers do not show overwhelming enthusiasm for the radioprimaria system, they have quite a bit of interest in it--and this interest can be traced to Prof. Tristan's visits.

Summary

The most striking finding from the teachers' questionnaire is how transient and how city-oriented are the rural teachers. In their own lives, the city is where they want to be. Most of them live there, and most of them wish they were teaching there.

They are not cynical about rural education, however. It is the key for rural development in their view, and for some teachers it appears to be the solution to all rural problems. While they feel education can be better used in the city, they by no means deny its value in the rural situation. They feel that primary education is a valuable asset to a person living in the rural area, and that primary

education need not lead to secondary school to have any value. It is valuable in itself in the rural area, in the teachers' opinion.

The classroom radio teachers are not all in favor of radioprimaria, but most of them feel it should be expanded. They see important problems within the radioprimaria system--particularly relating to the speed and the clarity of the programs. Radioprimaria is not generally a threat to them in their role as teachers or their relations with the students. The impression from the classroom radio teachers' questionnaires is that they are using radioprimaria because they have been talked into it; while the experience with radioprimaria has not made them promoters of the system, they find it somewhat of a help and see that it might be one solution to the problem of rural education.

CHAPTER SEVEN

Interviews with the Rural People

Aside from the measures or observations of what is going on within the school system, it seemed worthwhile to ask about the relation of the school system to the social system, the society. Is there any benefit to rural Mexican society from improvements in rural education? What will rural children be able to do after finishing the six years of primary?

So, before even visiting the schools, during more than seven weeks in June and July of 1972, visits were made to rural communities within a small radius of the city of San Luis Potosi to talk with the people there about education and its role in their communities. Eight communities were visited and, of these, six were communities with radioprimaria in their schools and with the full six grades. The other two had direct teaching schools, one with six grades and one with four.

Interview format

Before each interview, we explained why we were there and why we wanted to talk, then asked if they had any

children in the school. What about their own education? Why do you send your children to school? What hopes do you have for your children with education? Is it good to have a school here? Could you say why? What do you (or your husband) do? Is your education sufficient for that job? Would more education have been helpful for your present work? What will your children do after finishing school? Will they use what they have learned? Do you need the primary certificate to work here in this community? Elsewhere? What do most of the primary graduates do now? Has education changed them? Do many go to secondary school from here? Is there a difference between a primary graduate who has no more schooling and a primary dropout? Why do students dropout? What are the community's needs? Has the learning given from the school helped with those needs? Do the teachers have a community role? Does the school have a community role? How much does it cost to send your child to school each month? Is there a radio in the school here? What is it used for?

Three hundred fifty-two people were interviewed, in eight communities, as listed in Table Twelve.

The responses

The almost universal reaction was that school was good, and that "I will send my children to school." Most of the

TABLE TWELVE
List of communities, and persons interviewed

Community	Grades	Radio	Men	Women	Total
Tierra Blanca	6	yes	16	27	43
Tinaja	6	yes	24	23	47
Mezquital	6	yes	9	40	49
Mantequilla	6	yes	23	14	37
Pozos	6	yes	25	22	47
Carrizal	6	yes	21	24	45
San Marcos	4	no	17	28	45
Palmar Primero	6	no	21	18	39
TOTALS			156	196	352
Percent			44%	56%	

parents went to only one or two grades of primary school, and can only sign their names and do a little arithmetic. They want more education for their children than they received. When asked why more education was good, the typical reaction was hesitation leading to a circular response such as "It's just good." In communities closer to San Luis Potosi, people would relate more education to better work in the city, and the possibility of secondary school. To go to secondary school, more than a primary certificate is needed; money is needed too. Whereas primary school has no tuition or textbook fees, secondary schools do. Books are quite expensive. These financial barriers to secondary school usually include travel and/or living expenses in another community. Only one community among these eight had a secondary school.

Education's value

However, there was broad agreement that neither primary education nor secondary education had great value within the communities. People would say that education was helpful for city life and for finding work in the city. Quite representative is the remark of a family man who said the primary certificate is needed for work in the city, but not here. Many people were puzzled when asked how learning might be useful in their communities, as if they had never thought that learning should relate to their communities. Some saw it as a dumb or naive question asked by someone unfamiliar with their situation. One woman laughed.

How does this square with the other impression that almost everyone felt school was a good thing and would send their children to school? Simply put, the rural people would like (at least for their children) to live in the city, and nobody succeeds in the city without education. They have no dreams of developing their rural communities, and do not seem to expect education to be for that. Like parents everywhere, they want their children to have more than they had.

They also fear the city and city people. They know that they are vulnerable to exploitation by better educated people. More education, they seem to feel, would give them more power in their contact with the city. They would not be

cheated at the market or tricked by mysterious words on paper. Parents talked about bringing their children with them to the city now to help them in their buying and selling on market days.

From the interviews, however, it does not seem that primary education has been a passport to the city. Jobs are too scarce in the city (as the next section describes). Most graduates work in agriculture or raising animals or in making rope like their fathers do. (A study of the primary graduates showed, however, that most of them do not leave the rural area. The teachers were asked where their graduates of last June are now living; they replied that ten percent had moved away and that seventy-three percent still lived in the community. The teachers were unsure about seventeen percent.) Few use what they learned in their work--it is simply not needed for work in the rural area. Only in their contacts with the city does learning seem helpful. Within the community, people said time and again, the primary certificate is not needed, nor is there a practical difference (e.g., in employment) between primary graduates and primary dropouts--within the rural community.

Community needs

The people were quite often hard put to express any community needs. They would mention the lack of water and light quite often; a few would mention better roads or maybe

a telephone--both in the context of getting better medical care. In one community, the road is so bad that the doctor charges thirty-five pesos ($2.80) just to come. This cost, and the fact that there is no phone to call him anyway, causes many children to die from fairly simple causes during the winter. An old woman there told sadly of such tragedies in her own family.

But few people state their problems so well. Perhaps they were afraid of us as city people, but it seemed that they just were resigned to their situations. Most striking in this respect was a community located near the city. It had, for some reason, become the city dump. Trucks bounced up the road all day, bringing garbage and dumping it in the fields there. The result: flies, thousands of flies. Particularly during the wetter months of June and July, the flies swarmed through town in clouds and their buzz formed the background for the interviews. When it was routinely asked of the people what were the needs or problems in the community, not one of the forty-nine mentioned the garbage or the flies. If pressed for an answer, some mentioned the lack of water and light but still no mention of the garbage or the flies. But, when asked pointedly if there were any health problems from the flies, they told a long story of appeals to officials in San Luis Potosi to put a stop to the dumping, the failure of the repeated appeals, the health

problems caused especially to the children, and the conclusion of hopelessness to do anything about it. They had found themselves powerless before the forces of the city, and had not even thought about mentioning the matter to us.

Another example of this powerless vulnerability came to light in a more-remote town. The first day we arrived there, we were met by a number of men who were very concerned about who we were and why we were there. It seems that the year before two men had arrived in a Volkswagen too, robbed the village and attacked the people. The intruders, with a car and a gun, were able to pull off such an action without serious opposition or pursuit. For us, it was a lesson about the fear that reigns in the countryside, particularly a fear of exploitation by the "city"--with the education and technology and all that "city" implies to them.

The men there questioned us closely and become convinced, slowly, that we were who we said we were. They insisted, however, that when we returned the next day we have a letter from the education officials in San Luis to back up our explanation. So, next day, we had the letter they requested, written on official stationery with seals from the Office of Education and signed by the federal officials. But it turned out that there was no one in the community who could read the letter--not even the judge. He looked at it officiously for a minute or so, then asked that we read the letter to him.

whatever explanation the people gave for the value of education--and often they could not express themselves well--was related to success in city things like work or more education or marketing. There was very little expression of hope for improvements in their rural communities from education. Education seems to hold out a hope--however rarely reinforced--that city life is possible for a rural person. The alternative, as one woman put it, is to remain in the rural area. School is useful only if you leave here, she said; it helps you to find work elsewhere--if you cannot find work, you stay here and "continue suffering".

The role of the school

School is not related in the people's minds to the needs they most often mentioned--light, water, better roads. At times, an individual teacher took the initiative to solve these problems. But the changes did not come from better educated young people within the community itself.

As such, neither the teacher nor the school has a community role in the people's minds. Rare was the teacher who contributed to the community outside the classroom. For the most part, people said that the school and the teacher were just for the children. Even rarer was the teacher who lived in the community, as has been noted earlier. Seventy-eight percent of the teachers responding to

the questionnaire (and ninety-five percent of the classroom radio teachers) commute daily, or at least weekly, from San Luis Potosi. This represents another lesson to the community about education's relation to the city. Before the improvement of the roads, of bus service and cars, the teacher lived in the community. Now he need not, and he does not. This fact is not lost on the people, in their understanding of what education might do for them.

When school began on September 4, many rural teachers were not in their schools, but at the Education Office in San Luis seeking a transfer to a city school. There were crowds of teachers at the office well into October while rural schools went unattended. Not only was learning time lost, but also the rural community understood that the teacher would prefer to teach in the city.

Costs

Despite the government's efforts to provide free primary education, primary school still has real costs to the parents. Questions were not asked about school costs until some women in one community complained about costs. These costs include pencils and notebooks, purchase and maintenance of the radio, better clothes for the children, and some improvements for the school. Estimates of these costs ranged from one peso a month up to thirty-five, with five pesos being mentioned most often. Few families have just one school-age child so these costs can mount up.

Dropouts

Furthermore, there are the opportunity costs to families whose children were in school and so not helping the family in farming or rope-making. Many fathers took their children out of school to plant and harvest. These cost factors--real and opportunity--were the main reasons for dropouts that the people mentioned. Some parents prefer that their children drop out after a few years of primary once the children have some basic skills. As the child grows bigger, the opportunity costs of his time in school go up, and the parents are more reluctant to pay these costs. Statistics on one hundred forty-three schools in the three school zones near the city of San Luis Potosi show a universal drop in enrollment from first to sixth grade. It seems that the conviction in the parents that school is good is too vague to overcome the realities of earning power foregone or a child unenthusiastic about school anyway. These are the central reasons for dropouts.

Finally, awareness of radioprimaria was not widespread. Parents with children in grades four, five, and six were usually--but not always--aware of it, and certainly were if they had to pay some of the costs. Other people often did not know about the radio, and this seems to indicate that the introduction of radioprimaria was not a community event

nor is its presence considered important enough to be gossiped about. One boy, who had graduated from the sixth grade the June before radio was introduced, had not heard about radioprimaria from his younger friends. Neither had a priest, who had been ten years in his town, heard about radioprimaria there.

Generally, people who knew about it felt radioprimaria was a good thing. The level of awareness of radio's role, and how it was used, seemed low however. A few people indicated that radio would not be needed if the teachers were not so lazy. But feelings about the radio were not strong. When a classroom radio teacher would transfer and the new teacher not use radio, no one from the community ever protested to the center.

Summary

These interviews leave two broad impressions on which to base a conclusion.

First, there is the almost universal desire for schooling. Hardly anyone thought school was a waste of time; they wanted to send their children to school. Second, very few people thought primary education would make much difference for someone living in the rural area, but it would be helpful if the graduate moved to the city.

So the inescapable conclusion is that the rural people want their children to be educated in the hope that they can

move away to the city. They do not see education as a key to rural development, as the teachers did. They do not see rural value in education, as the teachers did. They do not think in terms of developing their own area. The idea is to develop yourself through education, and then go elsewhere. This is how school relates to their social situation.

Radioprimaria is not a splashy innovation. Many people have not heard of it. Radioprimaria does not impress the rural people as being a new stage in their educational possibilities--it is an aid to the traditional system, but not something that has captured their imagination.

CHAPTER EIGHT

Industries and Labor Offices

Interviews were also held with the personnel departments of the major industries--twenty-one of them--in or very near to the city of San Luis Potosi, with people at the industry-sponsored Center for the Socio-Economic Study of the Private Sector of San Luis Potosi (CESESPPAC), and with government labor officials. (A list of these people forms Appendix E.) The purpose here was to examine the labor situation, to assess the opportunities a rural person has in the city, with and without primary education. The rural people had talked so much about the primary certificate being useful in the city, it seemed useful to learn from employers what the labor situation was.

The interview with personnel officers touched on five questions:

1. What are the requirements for work in this company?

2. What kind of a job can a primary graduate get here?

3. How many people work here who do not have their primary certificate?

4. Does the company offer further training to workers with just a primary education?

5. What further opportunities does a primary graduate have with this company?

The requirements turned cut to be quite uniform. The following table, Table Thirteen, lists the pre-requisites demanded by the twenty-one companies surveyed.

TABLE THIRTEEN

Employment pre-requisites in twenty-one companies in San Luis Potosi

Pre-requisite	Number of companies demanding it
Medical exam	18
Completion of military service	19
Primary certificate	19
Letters of recommendation	14
Birth certificate	16
Photographs	18
Ability to read and write	1
Completed application	2

Asarco Mexicana, a large chemical company, hires only fathers and sons of present employees, but also demands the primary certificate, letters, military service, and photographs.

The most generally required items--primary education and completed military service--are notable, because of the time span between them. Young men are required to serve their military obligation during their nineteenth year, well after they may have finished primary school at thirteen or fourteen, or less. Rural boys most probably spend these intervening years in their rural communities, not using the

learning from their primary education. The army is said to teach some basic literacy skills, but soldiers only serve on Sundays for one year so that what is learned would be minimal. By the time they begin their twentieth year, their learning has certainly been forgotten to some large degree, if they have not been using it--and the rural people say learning is not used in the rural area.

Primary education is indeed required for most industrial jobs; once a boy drops out of primary school, he has effectively eliminated himself from such jobs. The other requisites are much easier to acquire--of course, military service is required.

An official of the State Labor Office talked about the opportunities open to a rural young man or woman who comes to the city with his primary certificate. He said that the rural person with his primary schooling can only hope to find work in industries as an unskilled laborer--a janitor or a construction worker. (These jobs, and most of the jobs mentioned in this section, are only for men.) But he is still above the illiterates and perhaps he can acquire a better job, like paymaster or an employee who is trusted. City people with only primary schooling are in the same situation, he said; the best jobs, those with a lot of responsibility, are reserved for the professionally educated people, way above the level of the rural person.

But, according to an official of CESESPPAC, the industry-sponsored socio-economic study center, the employment situation is so critical that the primary certificate has hardly any value. He insisted that to get a job in the city of San Luis Potosi, you need secondary education and that because of the over-supply of even people with secondary education, the companies and factories can be demanding. The best thing, he thought, for the primary graduate to do is to go to secondary school. At times, he said, you can get marginal jobs with primary schooling, or even without the primary certificate. He noted that San Luis has the circle of poverty (slums that surround the city, and that are constantly swollen by the influx of rural people looking for jobs that are not available) that exists around all sizable Latin American cities, and that the people living in these slums often have primary education. The real need in and around the cities is for more industry, and in the rural area the need is for more technical and specifically agricultural training.

The kinds of jobs

The industries themselves mentioned the following jobs as open to the primary school graduate: janitor; laborer, with the possibility of advancing to foreman (several companies mention the possibility of advancement, dependent on the worker himself); driver; welder; construction worker;

messenger; watchman; doorman; weigher; laboratory aid; engineer's helper; trainee to operate machinery; stevedore; warehouse attendant; loom operator; truck loader; and the very low jobs.

Several of these jobs, especially laborer, were mentioned more than once, and seven of the personnel officers mentioned that better positions were possible for a man with some experience in his job.

Some factories or companies in fact employ workers who are not primary graduates. Evidently they list the primary certificate among their requirements while in reality the job may not demand more than manual labor. Other companies have one or two less-educated workers, in the lowest positions in the company and hired long ago. The requirements of primary education are not enforced one hundred percent, but the advantage remains with the primary graduate.

While many of the companies demand only the primary certificate, several personnel officers say they give preference to applicants with more studies, and make it clear that there are enough applicants with more studies so that they can be selective. As one personnel officer put it, "The primary certificate is required to work here, but preference is given to persons who have more studies." Other hiring officers said similar things. They seem to be in the

favorable position of having more qualified applicants than they need, so they only take the best even though many of the applicants meet the stated requirements. Their accumulated comments bear out what the CESESPPAC official said: the best thing for a primary graduate to do is to go to secondary school.

The number of jobs

But how many jobs are there? Figures on the number of employees in all twenty-one factories were not available, but for seven factories the average is one hundred seventy-one jobs. Or, for all twenty-one companies, about thirty-six hundred jobs. Yet according to the 1970 census, the municipality of San Luis Potosi (basically the city by itself) has 42,534 persons with sixth grade education and 33,020 persons with more than sixth grade education: 75,554 persons in all. While the factories visited do not exhaust the industry in San Luis and while other forms of employment certainly exist, these factories do form a significant part of the job market. The local industries have a tremendous pool of people from whom to hire, and the education figures do not reflect any immigration from rural areas.

What training is given to workers with the primary certificate? Generally the training relates to the operation of a machine or the simple duties of the job. Only two companies mentioned efforts that they make to improve the employee's skills above those of the job at hand. A match

factory supplies a library and covers expenses for its employees to take correspondence courses. The company that stands out is a factory that makes mole, a special kind of Mexican sauce. As their accountant outlines it: "To train all workers, the company has a rotation system. We put each worker in a given job for a certain amount of time, then we rotate him into another job, and then into another until he is familiar with all the different departments in the factory. We do this so that each worker may understand the operation of all the machines and be able to work in any department at any time....

"Furthermore, the company has a system to provide financial help to those workers who want to study more. Right now, we have a girl studying business. She works in this factory and the company is paying for her studies. The company is ready to help employees who want to study."

Summary

From these interviews, it becomes clear, paradoxically, that the people in the area of San Luis Potosi are over-educated, that companies can take their pick of qualified primary and secondary graduates. The other side of the coin, of course, is that there is too little industry, that there is not enough appropriate employment for the graduates of the present school sytem, even within the city. Despite the problems within the society that limit the

opportunities for schooling, especially in the rural areas, the school system is producing more educated people than the society in the area of San Luis Potosi can absorb. The real problems within the society are those that limit the opportunities to use the schooling that is given.

The emphasis on the increase in school facilities will not have effects in the society until other institutions and structures within the society receive equal emphasis. When a young person gets out ouf primary school today, there are not enough other institutions in the society to receive him. Industry is very limited, secondary schools are few and expensive, the military is years away.

This is the central question that an evaluation of radioprimaria brings out.

CHAPTER NINE

Reflections

Radioprimaria is moving along haltingly. It is rarely supervised, but many teachers have shown ability to work with it on their own. It has not been set up in a way that lends itself to strict learning experiments, but the available data say that radio is doing a satisfactory teaching job--in comparison with what direct teaching is doing.

For the future, what direction should the Mexican authorities follow in their education efforts, and in their use of educational technology.

Informal use of the media

First, might there be applications of educational technology on an informal basis? Areas such as agriculture, irrigation, health, hygiene, and adult education in reading and writing deserve improvement. The poverty in the rural areas can in some ways be overcome by the people themselves if they were more knowledgeable in basic things like preventive medicine. Could radio provide significant assistance to the rural people by informal broadcasts to adults?

Research on the effectiveness of the media is saying more and more that the media do not have their effects directly, or on individuals one by one. Twenty-five years ago, Lazarsfeld argued that the mass media are more effective when linked with pre-existing personal relations. Since then, his arguments have received more and more confirmation. Communication impact has come to be seen as a complex process of interaction among persons, some mediated, some face-to-face. A social worker was living in one of the rural towns. Asked what the community needs were there, she did not mention the lack of water and electricity. She replied without hesitiation that the problem there was a lack of organization and cooperation among the people. The people were not really a community, she said. If they are to come to grips with their physical needs at all, they have to work together--but they do not.

This lack of community structure is precisely the type of situation in which the mass media as an agent of social change is least effective. As long as the people are not organized in any way that could serve as the basis for a listening group, candor demands that the possibilities of informal adult radio programming be minimized. If within even a small community not everyone is aware that radio is used in the school, it can be concluded that the personal communication networks in such a community are not strong,

and would not form the substratum needed for an effective out-of-school broadcast. Even if the people did get beneficial ideas from the radio, community divisions could blunt any initiative. In one town visited, plans had long been made to have piped water at the school; engineers came and did some preliminary work. But divisions in the community prevented the project from being completed. The people are not trustful of one another or of innovations. An electric line runs past the same town but no one has tapped into it, partly because of the costs, partly because of community opposition to advances like that.

Before radio can be used informally to provide information, these divisions have to be overcome. Radio will not do it. It seems, realistically, that very little can be expected of radio for informal education and for social change in rural Mexico until the rural people have some kind of organization and mutual trust.

Formal use of the media

If radio is to be used in rural Mexico now, it should link itself to the structures that exist, and the only fairly-organized structure in rural San Luis Potosi is the school system. It has been seen that the schools' problems stem particularly from the lack of organization that the system has, yet it is more organized than anything else in the countryside. A situation with no structure at all does

not instill optimism in someone who has seen the problems with the organization of the schools. But, despite the problems, the schools seem to offer the best possibilities as a setting for educational technology. Radio should be tried mainly in the context of formal education because it is there that the most structure is available, and it should be in that structure that radio will have the most success. Compared with any other institution in these rural communities, the school system is much more organized. It is the most promising base on which to build.

SEP has the only structures reaching into the rural area and is therefore in the best position to use technology as a supplement to its work.

This brings up the more basic problem: Too much is expected of education. The development needs of Mexico are more broadly based than the emphasis on education implies. Thirty-five percent of this year's federal budget is going to SEP. While most of these expenditures will probably be made for urban schools, the pattern of thinking is that education--one factor--can be improved to the point where it will solve the many problems within Mexican society, particularly in the rural areas. It has been observed that already there is too much education and too little employment for even the present number of primary graduates, and that education has no practical value in the

countryside. Yet despite all the problems and inadequacies of the school system as it stands, that system is still developed more than other society institutions and is putting out more educated people than are needed by those other institutions. Obviously, the solution is not to cut back in the schools but to realize what the scope of development is and make efforts in other sectors of the society.

The great limitations in the job market became clear from the talks with factory personnel officers. The whole category "city work" is a lot more restricted than the rural primary graduate tends to think. Industrial development is therefore one sector that needs to grow. Even city people with primary education must compete in a tight job market. More education makes employment more probable, but not because the education is necessary to do the job; the employer just hires the best person he can get from the large pool of educated people.

Would it be a good idea to tailor the rural curriculum to rural needs? This question was put to the teachers. One hundred two teachers felt that the curriculum should be the same in the city and in the rural areas, while one hundred thirteen felt that there should be a different study program in the rural area. Possibly, a change in the rural curriculum that was geared to rural needs could change the

whole conception of what education is for among the rural communities. If subjects could be studied and related directly to the rural reality, it might improve the life of the town and at the same time encourage parents to allow their children to finish school. This represents a real option that radioprimaria might consider; it relates to all rural school situations. It would be a basic change in the curriculum, but one that seems worth some further thought. Studies could first be made of the specific rural needs that curriculum should serve.

Rural development, particularly in the high desert country around San Luis, is a discouraging prospect. Water is the need; if it is possible at all, irrigation will be very expensive. Rural people themselves do not seem to think that rural life can be substantially improved. But there may be things that can be done for the rural areas: there are two agricultural schools in the rural parts of San Luis State--one in Tamuin and one in Villa de Reyes, both fairly far from the areas we visited. To go to these schools, you need to be a secondary graduate. Might this be a way to get more educated people back into the rural area and to contribute to rural development? The effect of these schools needs to be studied.

The outlook

There are two Mexicos. The city and the countryside are two worlds. The middle-class people in the city, like the

middle-class people in other countries, can live fairly well--insulated from the problems of the urban slums and the poverty of the countryside. Efforts like rural education, even rural education with radio, show up as quite meager when observed for a fairly extended period of time. It is not enough. It is not even close to being enough. The real need is for structural changes in the society that allow resources to be shared; now resources accumulate in the hands of a few urban people. The problem is many-faceted; the solution will have to be too. Better education represents only one facet of the answer.

With thirty-five percent of the federal budget going into education, is it realistic to ask for more or to ask that other sectors of the society get much greater emphasis than they do now? We really cannot say, and certainly the Mexican authorities can judge better than we can. One of the priorities that comes through, though, after a number of months in San Luis is that the people need more organization and trust in themselves. Until these elements exist in the rural communities, efforts in education, formal or informal, will suffer. Perhaps the model of the radio schools used in Northeast Brazil in the early 1960s is the best to propose to Mexico. This experiment, whose rationale was developed by Paulo Freire, featured community-building and the creation

of a political consciousness among the rural community. Until such a consciousness is formed, the rural people will not be effective in helping themselves nor will they be able to use well the help that may be offered to them from the city. The more basic question: do the authorities in the nation want the rural people to develop a political consciousness and understand why their country runs as it does? In Brazil, the authorities did not want this and they closed down Freire's project.

For whatever reason, too much is being asked of rural education, too much is being asked of radio. Technology can sometimes aid in the solution of a problem; it can also serve to keep the problem at arm's length. Instead of sending people into the rural area to organize and educate and draw out the human resources that are there, technology is used--but it is not the same. True, radioprimaria was designed and implemented because the price of a direct teaching system was too high. While radioprimaria may educate as well as the direct teaching situation does, it has been observed to be far from a solution to the more basic problems of development. And in itself, to achieve even the limited objectives of rural education, radioprimaria needs more resources than it now receives.

The future is not bright, but perhaps the challenge of what development really is can now be better understood.

The energy that Mexicans have put into radioprimaria is a hopeful sign that there is a real concern with the rural situation. But as the rural situation becomes more understood, its problems become more imposing and the efforts demanded of urban Mexico become more disturbing.

APPENDIX A
Summary of Observations

School	Open		Radio in use		Present/ absent
	YES	NO	YES	NO	
Saucito	x		x		44/3
Monte Oscuro	x		x		25/3
Suspiro Picacho	x		x		42/2
Mantequilla	x			x	----
Mexquitic	x		x		----
Tierra Blanca	x			x	----
Mezquital	x		x		36/4
Cerrito de Jaral	x		x		28/2
Col. Guanos	x			x	----
Ojo de Pinto	x			x	37/1
Las Moras	x		x		51/13
Milpillas	x			x	25/26
Enrique Estrada	x		x		25/10
Divisadero	x		x		34/4
La Morena	x			x	----
Rancho Nuevo	x			x	47/2
El Morro	x			x	52/5
Tercera Chica	x		x		35/5
Rivera	x		x		42/8
Carrizal	x		x		36/4
Benito Juarez	x		x		26/10
Tinaja	x		x		36/11
Maravillas	x		x		43/11
Los Moreno	x			x	20/22
Estanzuela	x			x	33/7
S. Pedro Ojo Zarco	x		x		70/5
Corte Segundo	x		x		51/0
Corte Primero	x			x	58/2
Villa de Pozos	x		x		33/2
La Pila	x		x		35/1
Los Pilares	x			x	----
Rancheria de Gpe.	x		x		----
Porvenir	x			x	----
Jaral	x		x		40/8

Paso Blanco	x			x	49/3
Laguna de Sta.Rita	x		x		29/6
Jassos	x		x		26/33
Pozuelos	x			x	28/7
Los Gomez	x			x	29/14
Agua Senora	x		x		26/11
Palma de la Cruz		x			----
Guadalupe Victoria	x		x		28/2
Arroyos	x			x	----
El Aguaje	x			x	----
El Zapote*	x				----
San Felipe*	x				50/0
Cerro de S.Pedro*		x			----
Barbecho*		x			----
Tapona*		x			----
Morelos*	x				----
Obregon*	x				----
Hidalgo*		x			----
Estancita*		x			----
TOTALS (for radio)	43	1	25	18	1219/253,
(non-radio)	4	5			83%

*indicates a school without radio

APPENDIX B

Schools that have ever used radio

School	1970-71	1971-72	1972-73
El Saucito	x	x	x
El Terrero	x		
Escalerillas	x	x	
Angostura	x	x	
Milpillas	x	x	
Garita de Jalisco	x	x	
Mantequilla	x	x	x
Los Gomez	x	x	x
Mezquital	x	x	x
Jose de Buenavista	x		
Tercera Chica	x	x	x
Tercera Grande	x		
Tierra Blanca	x	x	x
La Pila	x	x	x
Villa de Pozos	x	x	x
Jassos	x	x	x
Laguna de Sta. Rita	x	x	x
Los Urbanos	x		
Aqua Senora	x	x	x
Carrizal	x	x	x
Cerrito de Jaral	x	x	x
Corte Primero	x	x	x
Justino	x	x	
Estanzuela	x	x	
Gpe. Victoria	x	x	x
Jaral	x	x	x
Las Moras	x	x	x
Los Moreno	x	x	x
Maravillas	x	x	x
Mexquitic	x	x	x
Monte Oscuro	x	x	x
Ojo de Pinto	x	x	x
San Pedro Ojo Zarco		x	x
Paso Blanco	x	x	x
Rancheria de Gpe.	x	x	x
Rincon de Porvenir	x	x	x
Corte Segundo	x	x	x

Suspiro Picacho	x	x	x
Col. Benito Juarez	x	x	x
Puerto de Providencia		x	
Buenavista	x		
Rivera	x	x	x
Portezuelo	x		
El Morro	x	x	x
El Tinaja	x	x	x
Palma de la Cruz	x	x	x
Rancho Nuevo	x	x	x
Tejas	x		
Divisadero	x	x	x
Estacion Ventura	x		
Los Pilares		x	
La Morena	x	x	x
TOTALS	49	44	37

APPENDIX C

The tests

Arithmetic

Write, within the parenthesis, the letter that corresponds to the right answer.

EXAMPLE: The number 24 is twice as much as.....(a)

a) 12 b) 6 c) 48

Continue in the same way.

1. Notions and Concepts

1. An angle less than 90 degrees is.....( )

a) right b) acute c) obtuse

2. The decimal with the greatest value is.....( )

a) .5 b) .05 c) .005

3. The quantity that has eight units of thousands is.....( )

a) 6578 b) 7865 c) 8756

4. 500 grams form.....( )

a) 3/4 kg. b) 1/2 kg. c) 1/4 kg.

5. The quadruple of 7 is.....( )

a) 28 b) 18 c) 38

6. A half of a kilometer is equal to .....( )

a) 250 meters b) 500 meters c) 50 meters

7. The sign for meters squared is.....( )

a) m2 b) m3 c) m4

8. One peso is made up of 20 coins of.....( )

a) 5 cents b) 20 cents c) 10 cents

9. The fraction of the greatest value is.....( )

a) 3/9 b) 4/9 c) 1/2

10. The number read as seventy-eight thousand thirty-six is...( )

a) 78 036 b) 78 360 c) 78 306

11. A ton is the equivalent of.....( )

a) 10 kg. b) 100 kg. c) 1 000 kg.

12. The number read as eighty and twelve thousanths is.....( )

a) 80.120 b) 80.012 c) 80.12

13. A right angle measures.....( )

a) less than 90 deg, b) more than 90 deg. c) 90 degrees

14. The decimal 0.25 is equal to the fraction.....( )

a) 1/2 b) 1/4 c) 3/4

15. Three days is the same as.....( )

a) 72 hours b) 48 hours c) 24 hours

2. Computations

1) 468
329
47
+ 13

2) 39.7
6.94
0.326
+ 21.08

3) 42 + 9 + 53 =

4) 3290
- 1947

5) 100.4
- 83.329

6) 75802
- 8205

7) 74.8
x .04

8) 503
x 37

9) $35\overline{)4760}$

10) $12\overline{)309.6}$

11) 3/4 + 2/5 =

12) 3 1/2 + 4 1/3 =

13) 3/4 - 5/8 =

14) 5 2/3 - 3/4 =

15) 4/5 X 5/7 =

16) 3/5 divided by 1/2 =

17) 1/2 =

convert to a decimal

18) 7/3 =

convert to a mixed number

3. Problems

Read carefully each one of the following problems, carry out the work needed, and write the results in the places which are at the right.

EXAMPLE: 50 geometry kits are bought for a fourth grade, at $5.10 per kit. How much do all of them cost?

work
```
   5.10
x    50
------
255.00
```

Answer $255.00

Continue in the same way.

1. The students of a school want to buy a net for $75.00 and a ball for $115.00, but have collected only $100.80. How much more do they need to make the purchase?

Answer:_____

2. A contractor pays $11,500.00 each month to 25 workers. How much does each worker earn each year?

Answer:_____

3. A car in the United States costs 3,000 dollars. What is the price in national money, if the rate of exchange is $12.50?

Answer:_____

4. What is the area of a glass top for a table whose radius measures 0.40 meters? (Use 3.14 as the value for pi.)

Answer:_____

5. A businessman put $1,500 in a bank in bills of $50.00. How many bills did he deliver to the bank?

Answer:_____

Spanish

INSTRUCTIONS: Read carefully each one of the paragraphs. Afterwards, read what is at the right of each number and the three expressions which are given to you. Choose the one which answers best what is asked and mark it by writing an (x) in the parenthesis next to it.

EXAMPLE: Thousands of years ago the Babylonians learned to make themselves understood through writing, and since they had neither paper nor pens, they took soft clay and with that made tablets or little slates, on which they wrote by tracing the letters with pieces of broken pots.

1. What was the people that used this tracing for writing?

( ) the Chinese (x) the Babylonians ( ) the Egyptians

Continue in the same way.

A PARABLE

At the gates of a big city lived two men, each in his own house. And the two each had a wife and children and some good possessions.

One wanted that his name resound through the whole world, that praises be given to him, and that he be pleased to hear praises about the beauty of his wife, the manners of

his children, and the richness of his home. The other man did not want to be applauded, and he lived in a quiet way working and teaching his family to work.

The man who was anxious for honors used to give parties and receptions, and he had games and music, surrounded himself with great and powerful people, so that they would spread his reputation throughout the world. And the great and powerful men used to say: "It is true that this man spends a lot, but he invites us more for his vanity than for his liking for us." And the man who wanted honors used to be content with the praises he heard for his table, his wines, his furniture, and his carriages.

To the house of the man who did not seek honors came neither the rich nor the great, but when a poor man passed he was helped and when the man knew of someone sick he attended to the sick man.

The man who wanted honors did not know that in the land there were people who were poor or people who were sick.

And the children of this man who wanted honors were beautiful, and they knew how to sing and dance, and to make a show of their wealth.

But the children of the man who was not seeking honors knew how to work and did not know how to sing and dance, nor did they pride themselves on their wealth.

It happened suddenly that there was a fire that

destroyed the houses of both men. And the families, ruined now and poor, entered the city crying. The man anxious for honors was in despair and so were his children. The man who was not seeking honors was sad; but he was resigned and he comforted his children.

The proud man knocked at the door of the great and powerful, who did not recognize him, and there was not even a crust of bread. The humble man who had been good and caring, was called upon by the poor and he had enough to eat.

The days and months and years passed, and the man who had not sought honors kept working and so did his children with him, and they were all well thought of for their honesty. The man anxious for honors found no one to help him; neither he nor his children knew how to work. He was a beggar, and his children used to sing and dance in the squares and in the streets entertaining the crowds so they would not die of hunger.

The man who flatters the rich and the powerful will be abandoned; but the man who serves the poor and the lowly will, one day in his misfortune, by served by them.

1. The reading refers to

( ) people who lived in a city

( ) the men who lived in the countryside

( ) two men who lived in a big city

2. The characters in the reading

( ) each lived in his own house

( ) lived in the same house

( ) lived with their families in a palace

3. The characters of the story had

( ) a mother and father

( ) a wife and children

( ) brothers and elderly grandparents

4. Each family had

( ) only their house

( ) some possessions

( ) one table and their bed

5. One of the men in the reading wanted

( ) that he receive praises

( ) that he receive gifts

( ) to pass unnoticed

6. It pleased one of the characters to hear praise for his wife's beauty and

( ) the strength of his children

( ) the furnishings of his house

( ) the manners of his children and the richness of his home

7. The man who worked hard

( ) enjoyed himself in his free time

( ) taught his family to work

( ) was very strict with his children

8. The rich man spent his life

( ) traveling around the country

( ) at parties and receptions

( ) doing good for others

9. The rich man tried to surround himself

( ) with cultured people

( ) with religious people

( ) with the great and the powerful

10. The people who were often with the rich man

( ) loved him very much

( ) thought that he was hosting them only out of vanity

( ) used to help him in everything

11. When the poor passed by the house of the man who was not seeking honors

( ) they were helped

( ) no one attended to them

( ) they were scorned

12. When the man who was poor heard about someone sick

( ) he was indifferent

( ) he gave him money

( ) he took care of him

13. Of the children of the two men, those who sang and danced were those

( ) of the poor man

( ) of the sick man

( ) of the ambitious man

14. The children of the man who did not seek honors

( ) were loiterers

( ) ate too much

( ) knew how to work

15. The two men found themselves homeless because

( ) they were robbed

( ) their homes burned down

( ) they abandoned home

16. The ruined and poor families entered the city

( ) seeking help

( ) chatting with the people

( ) crying and sad

17. The humble man, good and caring

( ) stayed hungry

( ) received helped from the poor

( ) lost his whole family

18. The humble man and his family were

( ) thought well of for their honesty

( ) praised by all the people

( ) looked on with indifference

19. The rich man, who did not know how to work, when he found himself poor

( ) received help from people he had invited to his parties

( ) had to support himself by begging

( ) learned to work to support himself

20. This reading teaches us

( ) that rich men should be looked upon highly

( ) that men should be honest, hard-working, and helpful

( ) that poor people can end up as beggars

ANIMAL LIFE

Each year in May, along the length of many miles of the coast of the Gulf of Mexico, such an innumerable group of turtles gathers together to lay their eggs that the shells, about 60 to 90 centimeters long, produce a constant clatter while they move along the beach. The Mexicans who come to collect eggs walk over the shells as over a floor in motion. Finding the right place, each turtle makes a hole and deposits there 60 or 70 eggs which she covers carefully with sand. Three days later the great cluster of turtles goes away from the beach as suddenly as they arrived.

Those who search for the eggs--an activity which buzzards and coyotes practice too--begin to dig as soon as the first eggs are laid. The men remain on the beach for a time not much longer than the turtles, but the animals and the birds remain for the 21 days of the incubation period. At the end of those 21 days is produced a most interesting spectacle. The baby turtles begin to come up out of the sand like large flies and they run toward the water. The beach

collects life. The shells are still soft so that they are easy prey for the coyotes and buzzards, but because of the great numbers only a small percentage perish.

Still, even when they reach the water, the baby turtles are not safe. A little distance from the coast, forming immense schools, the fish are waiting. But the mother turtles have chosen this coast wisely because near the beach are many hollow rocks. In the holes the rest of the weak turtles find a haven until their shells grow hard.

21. Each year, on the coast of the Gulf of Mexico, a large number of turtles gather

( ) to places to form colonies

( ) to choose places where there is food

( ) to lay their eggs

22. The turtles gather, approximately, in the month of

( ) May

( ) December

( ) October

23. The people walk over the shells when

( ) they pass along the beach

( ) they come at night

( ) they come to gather eggs

24. When the turtles find the right place

( ) they make a hole and lay their eggs

( ) they hide themselves to protect themselves from other animals

( ) they form great deposits of food

25. Each turtle produces

( ) between 60 or 70 eggs, approximately

( ) almost a hundred eggs

( ) numberless little eggs

26. Once the eggs are laid

( ) they cover them with their bodies

( ) they cover them with seaweed

( ) they cover them carefully with sand

27. Once the turtles deposit the eggs

( ) they remain watching them till they hatch

( ) they leave the beach after three days

( ) they hide among the rocks

28. When the turtles leave

( ) they do so at night

( ) they go away one by one

( ) they leave all together

29. Besides men, the eggs are sought by

( ) the sea birds

( ) the fish

( ) the buzzards and coyotes

30. The egg-hunters stay on the beach

( ) one day

( ) three days

( ) a week

31. The egg-hunters begin to dig

( ) when the first eggs are laid

( ) a week after they are laid

( ) when the turtles have gone away

32. The incubation of the turtle eggs takes

( ) 21 days

( ) 15 days

( ) 28 days

33. During the incubation

( ) the egg-hunters stay on the beach

( ) the animals and the birds wait

( ) the mother turtles remain

34. The turtles, at birth, first

( ) stay in their holes

( ) look for food

( ) run toward the water

35. When the turtles are born

( ) the beach stays silent

( ) it seems that the beach is alive

( ) people come to see them

36. The shells of the baby turtles are

( ) soft

( ) very hard

( ) resistent

37. The baby turtles are born in great numbers so that

( ) they survive

( ) they die in great numbers

( ) they are cared for by the older turtles

38. When the baby turtles reach the water, waiting for them are

( ) their mothers

( ) great numbers of fish

( ) fishermen

39. The new-born turtles seek shelter in

( ) the sand

( ) the bottom of the sea

( ) the hollow rocks

40. The baby turtles remain hidden

( ) until the shell hardens

( ) until they leave at night

( ) until the other animals go away

THE MAYAN PRIESTS

The high priest of the Mayans was a person of such high dignity that he was never permitted to walk; he was always

carried in a chair, appearing before the crowds only on the greatest and most important occasions. He counseled the rulers and acted as a prophet, predicting the will of the gods. In turn, there were others who paid him tribute and who had as their main duty the offering of sacrifices. They dressed with the same pomp and splendor as the rulers; some covered their faces with masks and those who directed the sacrifice dressed in black.

At the beginning of the year, the priests used to celebrate a day in honor of the gods, called the "carriers of the year", who were four gods and whom the Mayans linked with the four cardinal points: each one with its particular color. The god of the South had yellow as his special color; the god of the East had red; the god of the North was bad and his color was white; finally, the god of the West was the god of death and desolation, and his color was black.

41. Among the Mayans the high priest is carried on

( ) a carpet

( ) a chair

( ) a platform

42. The activity of the high priest was

( ) to sing and dance

( ) light the bonfire

( ) make predictions

43. The priests who made the sacrifices wore

( ) masks

( ) black sandals

( ) black clothes

44. The Mayan gods represented

( ) the four seasons of the year

( ) the four cardinal points

( ) four sacred animals

45. The god of desolation was the god of the

( ) West

( ) North

( ) South

46. The color representing the North was

( ) yellow

( ) black

( ) white

B) The noise stopped; from time to time the only sound was the buzzing of the insects; the crickets intoned their rhythmic chorus; the grove faded into a formless darkness that disappeared in the gloom, and at a distance a song was heard. Suddenly a pale and weak light played gray shadows on the ground; the countryside appeared white and over this whiteness the tree-trunks rose like black columns, and the foliage crossed under the calm, peaceful sky.

From the slanted roof of the cabin, hung, like delicate little bells, pieces of ice that gave off little sparkles the way fireflies do. Suddenly a plume of smoke rises, and its wispy and slight shadow seems to be the only thing living in the persistent calm of the landscape.

Inside the hut, next to the fire which is making a party of flames and sparks, Eudoro, the old shepherd, and Alcino, the young shepherd, are having a chat in which the old man tells delightful fables in a story which goes like this:

In a certain time of the year, there lives in these parts a queen who dresses in a rainbow of colors; her cheeks have the blush of roses, her eyes shine like spangles, and she talks and laughs with a voice of crystal, like water that flows through the stones, gladdening the countryside with its babbling. Her name is very beautiful and when it is spoken, it seems that it rains happiness into the hearts of all men.

We will see her soon, says Alcino. No, answered Eudoro, now it is late, I am old and I will die this year, because we old people die, not when the leaves fall, but when the flowers are born.

47. What part of the day is told about?

( ) the morning

( ) the afternoon

( ) the night

48. The countryside described appears

( ) lit up by the moon and covered with snow

( ) rainy and dismal

( ) lit up by the sun

49. The shepherds pass their time in

( ) watching their livestock

( ) telling a story

( ) lighting the fire

50. The queen of the story represents

( ) the spring

( ) the winter

( ) the summer

51. What name would you give to this excerpt?

( ) the lonely hut

( ) winter and spring

( ) the queen and the shepherd

APPENDIX D

The teachers' questionnaire in full, with results for each item

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Some questions related only to radioprimaria; these items, with just the responses from the fifty-six radio teachers, will be listed after this first section that contains the responses from all two hundred thirty-one teachers.

1. Teacher's age. 18-24: 68 no answer: 7
   25-29: 63
   30-34: 41
   35-39: 23
   40-49: 18
   50-59: 18

2. Years of experience in primary teaching.
   1-5: 82 no answer: 4
   6-10: 71
   11-15: 28
   16-20: 21
   21-30: 16
   31-40: 8

3. Years of training.

	Normal	Normal Superior	Other
0	38	182	186
1	0	22	14
2	7	12	11
3	153	6	11
4	2	2	3
5	2	3	2
6	28	4	3
more	1	0	1

4. Sex. Men -- 82; women -- 145; no answer -- 4.
5. Classes taught.
4th -- 24
5th -- 14
6th -- 18
4th and 5th -- 2
5th and 6th -- 21
3rd and 4th -- 12
4th, 5th, and 6th -- 14
more -- 5
lower grades -- 119
no answer: 2

6. Do you live where you teach?
Yes -- 28
No -- 173
During the week -- 22
no answer: 28

7. Do you have another job?
Yes -- 23
No -- 198
no answer: 10

8. The needs of the rural areas will be not be resolved by the education of the children.
A (agree completely) -- 25
B (agree) -- 69
C (don't know) -- 31
D (disagree) -- 65
E (disagree completely) -- 21
no answer: 20

9. It is better for a child with primary education to move to the city.
A -- 66
B -- 109
C -- 2
D -- 35
E -- 11
no answer: 8

10. Frankly, in the rural areas education has no value.
A -- 3
B -- 11
C -- 2
D -- 117
E -- 93
no answer: 5

11. Education is the most important factor for rural development.
A -- 127
B -- 69
C -- 1
D -- 19
E -- 6
no answer: 9

12. The curriculum should be the same for the students in the city as for those in the rural areas.
A -- 42
B -- 60
C -- 5
D -- 90
E -- 23
no answer: 11

13. The only role of primary school is to prepare the student for secondary.
    A -- 4
    B -- 12
    C -- 1
    D -- 151
    E -- 52
    no answer: 11

14. Each teacher who lives where he teaches knows his students better.
    A -- 44
    B -- 75
    C -- 5
    D -- 84
    E -- 15
    no answer: 8

15. The rural teacher is freer to teach in his own style.
    A -- 25
    B -- 106
    C -- 11
    D -- 68
    E -- 8
    no answer: 13

16. Many fathers do not have much interest in the school.
    A -- 68
    B -- 117
    C -- 4
    D -- 23
    E -- 9
    no answer: 10

17. The rural teacher contributes a great deal to the development of Mexico.
    A -- 124
    B -- 78
    C -- 3
    D -- 6
    E -- 14
    no answer: 6

18. Teaching is not a profession that gives much satisfaction.
    A -- 9
    B -- 45
    C -- 10
    D -- 106
    E -- 35
    no answer: 26

19. I would encourage my better students to become teachers.
    A -- 22
    B -- 55
    C -- 30
    D -- 90
    E -- 20
    no answer: 14

20. I would remain in teaching even if I could get another job with better pay.
    A -- 24
    B -- 76
    C -- 37
    D -- 58
    E -- 22
    no answer: 14

21. The rural teacher is a person who does not receive sufficient attention or supervision; he is isolated.
    A -- 32
    B -- 53
    C -- 14
    D -- 93
    E -- 10
    no answer: 29

Which of the following problems is: A -- very serious; B -- serious; C -- less serious; D -- much less serious.

22. Lack of teaching material.
    A -- 93
    B -- 88
    C -- 42
    D -- 4
    no answer: 4

23. Too many students in the class.
    A -- 88
    B -- 99
    C -- 30
    D -- 7
    no answer: 7

24. The poverty of the students and the environment.
    A -- 151
    B -- 57
    C -- 12
    D -- 5
    no answer: 6

25. Sickness among the students.
    A -- 88
    B -- 76
    C -- 54
    D -- 4
    no answer: 9

26. Student behavior.
    A -- 21
    B -- 44
    C -- 101
    D -- 55
    no answer: 10

27. Lack of student interest.
    A -- 41
    B -- 68
    C -- 64
    D -- 50
    no answer: 8

28. Need for more teacher supervision.
    A -- 18
    B -- 63
    C -- 108
    D -- 27
    no answer: 15

29. Lack of cooperation from the fathers of families.
    A -- 117
    B -- 85
    C -- 16
    D -- 5
    no answer: 8

30. The economic situation of the teachers.
    A -- 115
    B -- 66
    C -- 30
    D -- 11
    no answer: 9

31. The method of teacher assignments.
    A -- 24
    B -- 49
    C -- 77
    D -- 20
    no answer: 61

32. Lack of textbooks.
    A -- 67
    B -- 55
    C -- 50
    D -- 33
    no answer: 26

33. Student absence.
    A -- 114
    b -- 69
    C -- 22
    D -- 7
    no answer: 19

For the next three questions, A = all; B = almost all; C = more than half; D = less than half; E = almost none; F = none.

34. How many students in your room have their own books?
    A -- 120
    B -- 14
    C -- 3
    D -- 6
    E -- 2
    F -- 34
    no answer: 52

35. How many students in your room have their own desks?
    A -- 80
    B -- 36
    C -- 15
    D -- 8
    E -- 2
    F -- 49
    no answer: 41

36. How many fathers want their children to finish primary school?
    A -- 58
    B -- 87
    C -- 20
    D -- 22
    E -- 2
    F -- 1
    no answer: 41

37. We asked the teachers about the reasons for student absence by giving them a list of possible causes for absence and asking them to rank-order these causes. The causes and their ranks follow.

Cause for absence	Ratings							No answer
	1	2	3	4	5	6	7	
Lack of interest by fathers	87	40	17	12	5	1	1	68
Lack of student interest	4	19	32	25	22	15	6	108
Student sickness	37	35	30	24	18	3	3	81
Students needed to work	38	68	30	13	3	2	2	75
	1	3	2	13	14	17	56	125
	11	18	18	22	26	21	8	107
	5	11	11	10	16	44	24	110

The most important causes for student absence: lack of interest by the fathers, the need for students to be working, and sickness among the students.

38. We asked the teachers to list the three most important needs in the communities where they teach.

Needs	Ratings		
	1	2	3
lack of parents' cooperation	11	12	16
lack of food or water	42	23	8
lack of student interest	1	3	1
lack of urbanization	3	9	8
lack of transportation and communication	17	14	22
health problems	9	25	18
lack of school materials	19	22	18
the general poverty	28	10	12
lack of work and recreation	39	28	20
no answer	72	85	13

The most important community needs in the teachers' view: lack of food and/or water; lack of work; the general poverty.

39. I would prefer to teach in the rural area rather than in the city--yes or no?

Yes -- 68
No -- 100
no answer: 63

40. What is the role of the school in the community? We asked the teachers to answer this question in their own words, and then grouped their responses into categories. We list each category, and the number of times it was mentioned first and the number of times it was mentioned second.

Category	Number of times mentioned	
	First	Second
general development	70	22
just for education	58	15
form citizens	6	10
leadership	28	13
no answer	69	171

41. What is the role of the school building in itself within the community? This question was coded similarly to the previous question.

Category	Number of times mentioned	
	First	Second
study center for all	20	4
just for school children	15	3
community use in general	67	3
construction model	24	4
something that demands work from us	1	0
no answer	104	217

42. What are the costs to send one child to school each month?

Pesos	frequency mentioned
1	5
2	14
3	23
4	13
5	41
6	9
7	10
8	5
9	1
10	21
12	4
14	1
15	10
20	1
23	1
30	1
35	1
80	1

no answer: 69

Responses to the questions that pertain to <u>radioprimaria</u>, using the fifty-six questionnaires returned by classroom radio teachers.

44. The teacher can teach better without radio.

A (agree completely) -- 5
B (agree) -- 19
C (don't know) -- 7
D (disagree) -- 24
E (disagree completely) -- 1

no answer: 0

45. <u>Radioprimaria</u>, as an aid to the teacher, can teach better than direct teaching alone.

A -- 5
B -- 22
C -- 0
D -- 20
E -- 6

no answer: 3

46. The classroom radio teacher gives up his authority to the teacher on the broadcast.

A -- 1
B -- 5
C -- 4
D -- 33
E -- 11

no answer: 2

47. The curriculum of radioprimaria does not contribute much to rural needs.

A -- 3
B -- 10
C -- 3
D -- 32
E -- 5

no answer: 3

48. Radioprimaria should be set up in other places because it is really a good help for rural students.

A -- 11
B -- 28
C -- 5
D -- 7
E -- 2

no answer: 3

49. The classroom radio teachers improve their teaching method listening to the teachers on the broadcast.

A -- 10
B -- 36
C -- 1
D -- 7
E -- 1

no answer: 1

50. Radioprimaria lessens the importance of the classroom teacher.

A -- 1
B -- 9
C -- 0
D -- 34
E -- 11

no answer: 1

51. Radioprimaria gets in the way of the personal relation between teacher and student.

A -- 2
B -- 5
C -- 1
D -- 40
E -- 8

no answer: 0

52. The classroom radio teachers learn to organize their schedules better because of radioprimaria.

A -- 11
B -- 35
C -- 1
D -- 7
E -- 2

no answer: 0

53. Radioprimaria gets the fathers more interested in the education of their children.

A -- 4
B -- 20
C -- 12
D -- 16
E -- 1

no answer: 3

54. Lack of clear radio reception is a _____problem.
    A (very serious) -- 13
    B (serious) -- 23
    C (less serious) -- 14
    D (much less serious) -- 3
    no answer: 3

55. The speed of the programs.
    A -- 11
    B -- 20
    C -- 19
    D -- 3
    no answer: 3

56. The voices of the teachers on the broadcast.
    A -- 11
    B -- 8
    C -- 26
    D -- 7
    no answer: 4

57. The students do not pay attention to the programs.
    A -- 8
    B -- 22
    C -- 20
    D -- 3
    no answer: 3

58. Difficulties in supervision during programs for just one group.
    A -- 2
    B -- 16
    C -- 23
    D -- 10
    no answer: 5

59. In your school does the radio signal come in clearly?
    A (never) -- 1
    B (almost never) -- 3
    C (at times) -- 23
    D (almost always) -- 22
    E (always) -- 6
    no answer: 1

60. Does your radio work well?
    A -- 1
    B -- 0
    C -- 12
    D -- 18
    E -- 23
    no answer: 2

61. Do you receive the <u>Correo</u> on time?
    A -- 2
    B -- 0
    C -- 4
    D -- 12
    E -- 34
    no answer: 4

62. The <u>radioprimaria</u> programs are too fast.
    A -- 0
    B -- 5
    C -- 31
    D -- 9
    E -- 7
    no answer: 4

63. The radioprimaria programs do not leave enough time for activities and exercises.

A -- 5
B -- 8
C -- 27
D -- 10
E -- 0

no answer: 6

64. The radioprimaria programs have too much content.

A -- 3
B -- 4
C -- 26
D -- 10
E -- 0

no answer: 3

65. When the radio is giving a broadcast intended for only one group, the other groups in the room waste time.

A -- 22
B -- 15
C -- 14
D -- 2
E -- 0

no answer: 3

66. Who bought the radio?

The teacher -- 42; the fathers of the families -- 5; someone else -- 4; no answer -- 5.

67. How much does the radio help you teach each of the following subjects?

subjects	not at all	a little	a lot	very much	no answ
language	0	12	27	13	4
arithmetic	0	16	25	10	5
nature study	0	9	29	12	6
geography	1	16	18	14	7
history and civics	2	12	22	13	7
music	1	7	14	29	5
spelling	1	10	25	13	7
penmanship	2	12	26	9	7
physical education	4	15	15	15	7
practical activities	7	19	17	6	7
silent reading	4	22	16	7	7

68. How much do you like each of the following subjects in radioprimaria?

subjects	not at all	a little	a lot	very much	no answ
language	0	4	28	19	5
arithmetic	0	10	19	21	6
nature study	0	14	18	19	5
geography	1	13	20	17	5
history and civics	3	7	17	25	4
music	3	4	19	24	6
spelling	1	5	23	21	6
penmanship	2	7	17	24	6
physical education	2	14	15	19	6
practical activities	1	19	17	13	6
silent reading	1	14	25	10	6

69. How many of the radio lessons should be common lessons?
    All -- 17
    Almost all -- 22
    Almost none -- 5
    none -- 0 no answer: 12

70. The Correo seems to me...
    very complicated -- 1
    a bit complicated -- 5
    clear and useful -- 38
    a bit simple -- 3
    very simple -- 3 no answer: 6

71. If in your opinion there are some subjects that need more time for activities, which subjects are these?

subjects	number of times mentioned	
	first	second
arithmetic	22	24
history	1	3
geography	1	1
language	22	12
practical activities	1	2
no answer	9	14

72. What is the role of the classroom radio teacher within the community?

category	number of times mentioned	
	first	second
leader	18	5
catalyst through education	7	5
one who adapts to the community	3	0
one who promotes community activities	0	1
no answer	28	45

APPENDIX E

Industries: Person Interviewed, Size in Number of Employees, Product

Person interviewed	Employees	product
1. Fabrica de Chicles Canel, S.A. Sr. Mendizabal de la Maza, President of CESESPPAC	358	chewing gum
2. Guanos y Fertilizantes de Mexico, S.A. Sr. Camilo Gonzales, Accountant	---	fertilizers
3. Avantram Mexicana, S.A. Sr. Jorge Hansser, Chief of Personnel	---	cashmere
4. Gases Industriales, S.A. Sr.Jose Luis Romo, Chief Accountant	---	chemicals
5. Encajes Mexicanos, S.A. Sr. Rafael Rodriguez Alvarez, Chief of Personnel	169	textiles
6. Guantes Industriales, Sr. Ricardo Mendez Urostegui, Chief of Personnel	50	gloves
7. Cia. Minera Las Cuevas, S.A. Sr. Juan Esquivel Rodriguez, Topographical Engineer	---	mining
8. Coyoacan Quimica, S.A. Sr. Arnulfo Zapata, Chief of Personnel	---	chemicals
9. Quimica Potosi, S.A. Sr. Sergio Amezcua Rivera, Chief of Laboratory Personnel	---	chemicals
10. Aceros San Luis, S.A. Sr. Enrique Zavala Zavala, Assistant Accountant	180	steel rods and wires
11. Productos de Leche Coronado, S.A. Sr. Haro Zandate Romero	---	milk products
12. Cia. Hulera San Luis, S.A. Sr. Javier Franco Medina	---	rubber products
13. A.C Mexicana. Sr. Luis Diaz Mendez, Chief of Personnel	102	heavy machinery
14. Industrias Quimicas de Mexico, Sr. Roman Orta Lara, Accountant and Chief of Personnel	---	chemicals

15.	Fundidora de Estano, Sr. Lorenzo Ruiz Lopez, Chief of Personnel	---	tin
16.	Cia. Mexicana de Refractarios A.P. Green. Sr. Jose Guerra Zarzoza, Chief of Personnel	---	---
17.	Textiles Potosi, S.A. Sr. Agustin Nunez Sanchez, Chief of Personnel	---	textiles
18.	Cia. Cerillera Ambos Mundos, S.A. Sr. Alfredo Farias Gomez, Public Accountant	36	matches
19.	Productos Marpesa, Mole Dona Maria Maria, S.A. Sr. Hipolite Conde, Accountant	300	condiments
20.	Minerales Pensalt, S.A. Sr. Jorge Rodriquez, Laboratory Chief	---	minerals
21.	Asarco Mexicana, S.A. Sr. Andres Ramires Contreras	---	silver, copper, zinc, sulfuric acid

22 Sr Jorge Rodriguez Cazares, State Labor Office
23. Sr. Gilberto Vasquez, CESESPPAC
24. Sr. Carlos Martinez Morin, CESESPPAC
25. Sr. Juan Palacios Perez, Chief of the Department of Labor and Social Planning, State of San Luis Potosi.